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STUDIES IN THE GENERA OF THE *DIOSMEAE* (RUTACEAE): 10. A REVIEW OF THE GENUS *EUCHAETIS*

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ABSTRACT

The twenty-three species belonging to the genus *Euchaetis* Bartl. & Wendl. are listed with diagnoses and keys. Species not recently published are described in detail from fresh material with up-to-date distribution maps and lists of specimens examined. *Euchaetis dubia* Sond. is transferred to *Macrostylis*.

UITTREKSEL

STUDIES IN DIE GENERA VAN DIE *DIOSMEAE* (RUTACEAE): 10. 'N OORSIG VAN DIE GENUS *EUCHAETIS*

Die drie-en-twintig soorte van die geslag *Euchaetis* Bartl. & Wendl. met diagnose en sleutels word gekatalogiseer. Soorte nie onlangs gepubliseer nie word van vars materiaal beskryf. *Euchaetis dubia* Sond. is na die geslag *Macrostylis* oorgedra.

HISTORICAL BACKGROUND

The generic name *Euchaetis*, meaning "beautifully tufted with hairs", was proposed by Bartling & Wendland in their revision of the *Diosmeae* published in 1824. They placed only one species, *E. glomerata* in their new genus but two other species with bearded petals, which they placed in *Acmadenia*, *A. laevigata* and *A. pungens*, have since been transferred to *Euchaetis* as *E. meridionalis* and as *E. pungens*.

Ecklon and Zeyher, in their revision of the *Diosmeae* (1835), recognised four species of *Euchaetis* two of which, *E. elata* and *E. flexilis*, have been upheld. They mistakenly applied the name *E. glomerata* B. & W. to a species from near Caledon, later to be named *E. linearis* by Sonder, and proposed the new name *E. abietina* for a species from near Clanwilliam which had already been named *E. glomerata*.

Sonder in his revision of the *Rutaceae* for the *Flora Capensis* (1860) recognised five species in the genus *Euchaetis*, three of which had been previously published. In addition he proposed the name *E. linearis* for the species found by

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Ecklon & Zeyher near Caledon and, doubtfully, the name *E. dubia* for another species, *(Zeyher 291)*, from the west coast. The material available to Sonder did not properly show that the style and filaments could elongate considerably, characters which have led to the transfer of this species to the genus of *Macrostylis* in this work. Unfortunately, Sonder was unaware of the work done by Turcszaninov who had named the same collection, *Zeyher 291*, *Acmadenia cassiopoides* in 1858. Turcszaninov also saw the flower in its earlier stage before the elongation of the style and filaments and, as it possessed rather large staminodes, he placed it in *Acmadenia*.

Schlechter published two names in 1898, *E. longibracteata* and *Acmadenia diosmoides*, of which the latter has since been transferred to *Euchaetis*. Unfortunately he got his cited specimens switched and this has led to a certain amount of confusion in typification. In 1900, Professor Schinz, who was a great friend of Rudolph Schlechter, named the plant which Schlechter had collected at Sir Lowry's Pass, *E. schlechteri* in honour of his friend.

Dümmer in the *Kew Bulletin* (1912) published four new names, two of which, *E. burchellii* and *E. ericoides*, are upheld while *E. bolusii* and *E. radiata* are now considered to be synonyms of *E. longibracteata* Schltr.

In 1913 Phillips proposed the name *Euchaetis uniflora* for a plant with relatively large pink flowers from near Albertinia. Unfortunately it turned out to be better placed in *Acmadenia* and the new combination, *Acmadenia uniflora* (Phillips) Phillips, was made by Phillips in the *Journal of South African Botany* in 1943.

It is quite certain that our knowledge of this genus would have been very incomplete had it not been for the very active and accurate work on the part of Miss Elsie Esterhuysen whose many collections of these insignificant plants from all parts of the southern Cape Province, are housed in the Bolus Herbarium.

Generic Description

Euchaetis Bartl. & Wendl., *Diosmeae* in Beitr. Bot. **1**: 15 (1824); A. Juss. in Mém. Mus. Hist. Nat., Paris **13**: 472 (1825); Don, Gard. and Bot. **1**: 785 (1831); Eckl. & Zeyh., Enum. Plant.: 104 (1835); Endl., Gen. Plant. **2**: 1158 (1840); Lindl., Veg. Kingd.: 471 (1853); Sond. in Flor. Cap. **1**: 371 (1860); Benth. & Hook., Gen. Plant. **1**: 289 (1862–1867); Engl., Pflanzenfam. **19a**: 276 (1931); Dyer, Gen. S. Afr. Flow. Pl. **1**: 291 (1975). Type species: *E. glomerata* Bartl. & Wendl.

Shrubs 0,3–1,5 m, usually less than 1 m tall, erect, and, with one or two exceptions, single-stemmed at base. *Branchlets* fairly erect, slender, glabrous or puberulous. *Leaves* 2–15 mm long, 0,9–4 mm broad, linear, linear-lanceolate, narrowly lanceolate, lanceolate, broadly lanceolate, elliptic, ovate or orbicular;

flat, round-backed, sub-complicate, or subulate; erect or spreading, alternate or opposite. *Inflorescence* terminal, solitary or twin or aggregated into heads of up to 60 florets, flowering at different times and, except in the case of *E. longibracteata,* without any conspicuous involucral leaves. *Flowers* subtended by one, or rarely two, bracts and two bracteoles. *Petals* five, distinctly divided into claw and limb; *claw* transversely bearded above, ciliate on the margins and narrowing below, forming a cage around the reproductive parts of the flower; *limb* white or pale pink, usually spreading. *Staminodes* five, rarely absent, usually a vestigial sessile gland, 0,05–0,2 mm long. *Filaments* five, usually about 1 mm long, glabrous, acicular. *Anthers* five, dorsifixed; apical gland globose, minute, usually 0,05–0,2 mm long. *Pollen* 28–55 μ average 46 μ long, 18–35 μ average 25 μ broad, ellipsoid, yellow, sticky, triporate. *Disc* enveloping, obvallate or spreading, exceeds the ovary. *Stigma* 0,2–1,0 mm diam., capitellate or capitate globose. *Style* becoming 0,5–1,6 mm long, glabrous, erect, or, at some stage, deflexed. *Ovary* 5-carpellate, except for *E. tricarpellata*, 0,7–1,0 mm diam.; apices globose, usually glabrous or sparsely setulose, in one case, *E. vallis-simiae*, densely pubescent. *Fruit* 5-carpellate, except for *E. tricarpellata*, glabrous, sparsely setulose or, in the case of *E. vallis-simiae*, puberulous; *horns* 0,5 –7,0 mm long, but mostly in the 1 to 2 mm range, in the case of *E. pungens* deeply cleft at the apex. *Seeds* black, shining except in the case of *E. ericoides*, *E. glomerata* and *E. tricarpellata* where matt.

Characters which distinguish the genus *Euchaetis* are: the transversely bearded, ciliate petals which totally screen the gynoecium and androecium (Fig. 1); the very short filaments and style which do not lengthen greatly but which remain within this enclosure; the staminodes being vestigial or absent; the anthers with a very small, usually globose, apical gland and the glabrous style and filaments.

DISTRIBUTION

Plants belonging to the genus *Euchaetis* are to be found growing only in the south and south western Cape within an area defined by the Cape Geological Series as shown by a dotted line in the distribution map (Fig. 2). From the north, near the Pakhuis Pass in the Clanwilliam Division, the area of distribution extends southwards in mountainous regions to near the mouth of the Palmiet River in the Caledon Division. On an approximate east-west axis, starting from the Uilenkraal River near Danger Point, the area of distribution extends eastwards, mostly on the coastal and limestone hills, to Herolds Bay near George. From here there is a discontinuity of 155 km eastwards until two species appear on the Baviaanskloof and Cockscomb mountains.

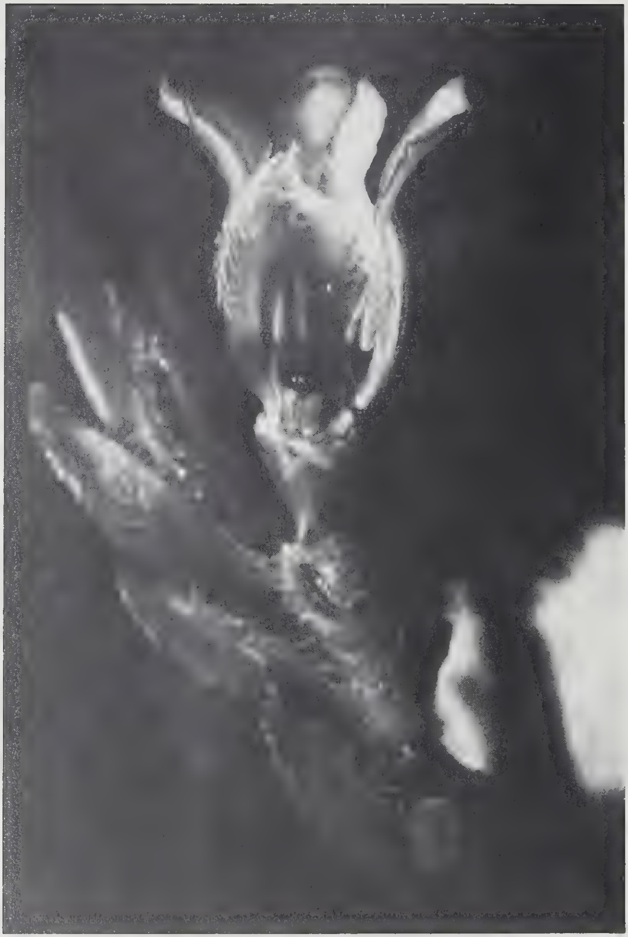

FIG. 1.
Typical flower of the genus *Euchaetis*, with two petals removed, showing the androecium and gynoecium totally screened by the transversely bearded petals.

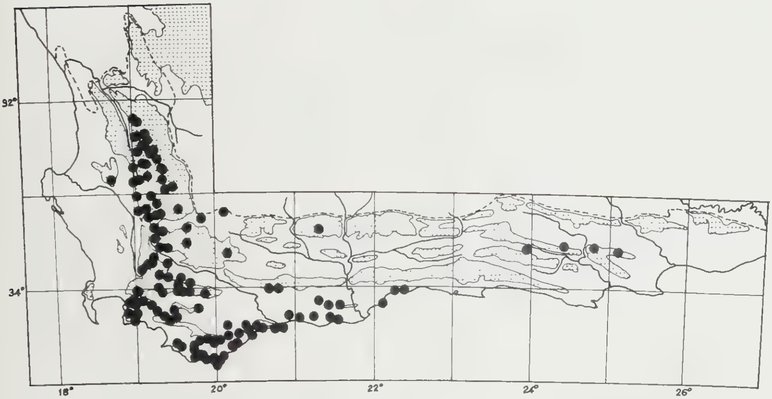

FIG. 2.
Distribution of the genus *Euchaetis*.

KEY TO THE SPECIES OF *EUCHAETIS*

1	Disc closes over the ovary at first	2
1+	Disc obvallate or spreading as in *Diosma*	11
2	Fruit tricarpellate	**9. tricarpellata**
2+	Fruit 5-carpellate	3
3	Fruit with horns 0,5 mm long, deeply cleft	**1. pungens**
3+	Fruit with horns not deeply cleft	4
4	Leaves, bracts, bracteoles and sepals gibbous behind the apex	**10. vallis-simiae**
4+	Leaves etc. not gibbous behind the apex	5
5	Leaves opposite, never alternate	6
5+	Leaves opposite or alternate on the same plant	9
6	Leaves with a prominent gland-stepped or scabrous midrib	**5. scabricosta**
6+	Leaves with gland dots scattered in the vicinity of the midrib	7
7	Leaves orbicular	**2. laevigata**
7+	Leaves lanceolate	8
8	Shrub dense, many-stemmed at base of plant	**4. burchellii**
8+	Shrub sparse, single-stemmed at base of plant	**3. albertiniana**
9 (5+)	Leaves sparsely pubescent, alternate, sometimes opposite at base	**7. intonsa**
9+	Leaves glabrous, opposite or alternate	10
10	Leaves broadly lanceolate, sub-complicate	**6. meridionalis**
10+	Leaves lanceolate, fairly flat	**8. ericoides**
11 (1+)	Disc obvallate, not closing over the ovary and not spreading	12
11+	Disc open, margin sinuate crenulate, exceeds the ovary at first	19
12	Conspicuous involucral leaves present	**17. longibracteata**
12+	Involucral leaves absent	13
13	Style at all stages erect, petals 5,5 mm long	**11. cristagalli**
13+	Style at some stage deflexed, petals 5 mm long or less	14
14	Leaf margins villous-ciliate (not crisped ciliate), petals acute	**12. avisylvana**
14+	Leaf margins not villous-ciliate, petals obtuse	15
15	Leaves obtuse, apex sacculate, margins broadly translucent	**15. flexilis**
15+	Leaves acute or if obtuse, apex not sacculate	16

16	Leaves petiolate, flat, orbicular, 4 mm long	**16. glabra**
16+	Leaves not flat	17
17	Leaves ovate, obtuse, fleshy, spreading	**18. esterhuyseniae**
17+	Leaves lanceolate or linear-lanceolate, adpressed	18
18	Fruits with horns 0,5–1,0 mm long, apical flowers opening first	**13. elata**
18+	Fruits with horns 3,5 mm long, apical flowers last to open	**14. glomerata**
19 (11+)	Disc open, sinuate-crenulate, style erect at all times, stigma 0,6–1,0 mm diam., capitate	**23. schlechteri**
19+	Disc open, sinuate-crenulate, style at some stage deflexed, stigma 0,2–0,5 mm diam., capitellate	20
20	Leaves obtuse, apex thickened	**19. elsieae**
20+	Leaves acute	21
21	Leaf apex incurved mucronate	**22. diosmoides**
21+	Leaf apex with a straight sharp mucro	22
22	Fruit with horns 1,5 mm long	**20. linearis**
22+	Fruit with horns 7 mm long	**21. longicornis**

1. **Euchaetis pungens** (Bartl. & Wendl.) Williams in Jl S. Afr. Bot. **40** (4): 279 (1974).

Acmadenia pungens Bartl. & Wendl., Diosmeae in Beitr. Bot. **1**: 64 (1824). Type: L. hand specimen on sheet No. *4784* in Willdenow's herbarium, received from Jacquin (B, holotype; W, isotypes). *Acmadenia harveyana* Schltr. nom. nud.

The following description, from fresh material, amplifies that given by Bartling and Wendland in 1824.

Shrubs up to 0,7 m tall, rigidly bushy, single-stemmed with a rough warty bark at base, growing in drift sand. *Branches* glabrous, rough, dirty-brown, devoid of leaves, variously bent. *Branchlets* dichotomous, very short, minutely puberulous between the leaves, densely clothed with leaves. *Leaves* 2,8–5 mm long, 2,5–4 mm broad, ovate or elliptic, acute, mucronate, sessile, sub-amplexicaulate, sub-complicate, greyish-green, glabrous, quite thick, opposite, decussate, crowded, erect-spreading; margins thick, cartilagenous, minutely ciliolate; abaxial surface with a few scattered gland dots. *Inflorescence* terminal, sessile, normally twin, without conspicuous involucral leaves. *Bract* one, leaf-like, 3 mm long, 2,3 mm broad, orbicular, acute, mucronate, ciliolate, glabrous, gland-dotted, sub-complicate, sessile. *Bracteoles* two, 3 mm long, 1,6 mm broad, oblanceolate, acute, mucronate, glabrous, 1–2 gland-dotted; midrib quite thick; margins pellucid, ciliate. *Calyx lobes* five, 4 mm long, 2,3 mm wide, elliptic, acute, mucronate, greenish and thickened above, glabrous; margins ciliate, broadly translucent. The lobes are more bract-like than usual being deeply divided. *Petals* five, 5,2 mm long, overall; *limb* 2 mm long, 1 mm broad, oblanceolate, acute, glabrous, recurved, apex with one or two minute hairs; *claw* 3,2 mm long, 1,3 mm broad, with a dense erect bushy transverse beard above, upper part of the translucent margins densely crisped ciliate, midrib fringed with hairs. *Staminodes* five, vestigial, 0,2 mm long, deltoid or completely absent. *Filaments* five, becoming 1,5 mm long, subulate, glabrous. *Anthers* five, before anthesis 1,3 mm long, 0,8 mm broad, cuneiform-ovoid, orange-yellow; apical gland minute. *Pollen* 50 μ long, 25 μ diam., obloid. *Disc* exceeds and closes over the ovary at first, green, exudes nectar. *Stigma* 0,7 mm diam., globose, green. Style becoming 1,3 mm long, erect, glabrous, sub-5-angular. *Ovary* 5-carpellate, 1 mm diam., apices pubescent. *Fruit* 5-carpellate; *carpels* 6–8 mm long, glabrous below, puberulous towards the apex; *horns* divided into two to each carpel, 0,5 mm long, obtuse. *Seed* 5,5 mm long, 2,5 mm broad, black, shining; aril white without any trace of black.

Euchaetis pungens is recognised as distinct with its rigid prickly habit, having the anther cuneiform-ovoid in shape, the disc closing over the ovary with a 5-sided aperture fitting the 5-sided stigma, having evanescent staminodes and having a fruit with the horns deeply divided. It has also been noted that the calyx lobes are unusually deeply divided.

2. **Euchaetis laevigata** Turcz. in Bull. Soc. Imp. Nat. Mosc. **31**. 1: 438 (1858). Type: between Cape Agulhas and Potberg, on limestone hills, under 500 ft., 3/8/1831, *Drège IV, C, a, 2* (BM, E, K, MEL, P, S, isotypes).

Acmadenia laevigata E. Mey. in Drège Zwei Pflanzen. Doc.: 122, 161 (1844). nom. nud.

Acmadenia assimilis Sonder in Flor. Cap. **1**: 383 (1860). Type: as above.

Euchaetis laevigata differs from both *E. scabricosta* and *E. meridionalis* in having leaves that are always opposite with the midrib recurved, somewhat smaller, orbicular in outline with gland dots scattered and not just on midrib and margins. The shoots are dry without any trace of resin or wax. A detailed description, from fresh material, has been given in the *Journal of South African Botany* **44** (4): 333 (1978).

3. **Euchaetis albertiniana** Williams in Jl S. Afr. Bot. **41** (3): 167 (1975). Type: CAPE—3421 (Riversdale): Near Askop on south side of road 16 km west of Albertinia (-AB), 180 m alt., 2/3/1974, *Williams 1879* (NBG, holotype; K, PRE, STE, isotypes).

Euchaetis albertiniana is recognised as distinct from *E. burchellii* Dümmer in that it is destroyed by fires whereas *E. burchellii* develops a stout rootstock from which it may regenerate after fires—a character seldom noted on herbarium sheets. However, the leaves in *E. albertiniana* are often adpressed, ciliolate with an apical callus, whereas those of *E. burchellii* are never so. The anther in *E. albertiniana* possesses a small pointed gland, but that of *E. burchellii* is minute. *E. albertiniana* differs from *E. laevigata* Turcz. which has leaves complicate, orbicular, spreading and somewhat more recurved towards the apex with the apical gland on the anther minute as in *E. burchellii*. *E. albertiniana* is found in the vicinity of Albertinia. *E. burchellii* is more widespread being found in sandy soil from beyond Great Brak River in the east to Uilenkraal River near Gansbaai in the west.

4. **Euchaetis burchellii** Dümmer in Kew Bull.: 90 (1912).

Type: CAPE—3422 (Mossel Bay): sandy hills near the landing place, Mossel Bay (on shrubby sandy dry hills close to our station near landing place Mossel Bay), 18/10/1814, *Burchell 6239* (K, holotype).

Shrubs to 1 m tall forming a dense bush with many stems arising from a stout rootstock. *Branches* short, fairly erect, bark scaly and rough. *Branchlets* numerous, slender, very short, puberulous, well-clothed with leaves. *Leaves* to 4,5 mm long, 1,5 mm broad, lanceolate, obtuse without any mucro, sub-trigonal, glabrous, eciliate, sessile, opposite, erect, sub-imbricate, decussate, about twice times longer than the internodes. *Inflorescence* terminal, usually twin, white or pink. *Bract* one to each flower, 1,9 mm long, 1,3 mm broad, ovate, obtuse, glabrous, thickened towards the apex, sessile, very sparsely ciliate, midrib 1–2 gland-dotted. *Bracteoles* two, 1,6 mm long, 0,8 mm broad, elliptic, obtuse, glabrous, apex thickened; margins broadly translucent, ciliolate. *Calyx lobes* five, 2 mm long, 1,5–2 mm broad, roughly orbicular, glabrous; apex blunt, trigonal, green; margins broadly translucent, ciliolate. *Petals* 3,7–4 mm long, 2,5 mm broad; *limb* orbicular, 1–2 gland-dotted; *claw* transversely bearded, midrib pubescent, margins ciliate. *Staminodes* vestigial, 0,15 mm long, 0,1 mm diam. *Filaments* five, 1,3 mm long, pale, acicular. *Anthers* five, 0,6 mm long, wine-coloured; apical gland minute. *Pollen* 52 μ long, 32 μ broad, ellipsoid with three longitudinal grooves. *Disc* closes over the ovary at first. *Stigma* 0,5 mm diam., globose, capitate. *Style* becoming 1,5 mm long, erect, persisting. *Ovary* 5-carpellate, 0,7 mm diam., with a few hairs at the sides towards the apex of each segment. *Fruit* 5-carpellate, 6 mm long overall, glabrous, gland-dotted; *horns* 1,2 mm long, clasping a gland at the tip. *Seed* 4,2–4,8 mm long, 1,8–2 mm broad, black, shining; aril white.

Euchaetis burchellii is a lowland coastal species found growing in stabilised wind-blown sand never very far from the sea, at altitudes of from 33 to 250 metres above sea level. Its geographical range extends from Herolds Bay near George in the east to the Uilenkraals River near Gansbaai in the west, a distance of about 275 km.

It is a dense shrub with many stems arising from a stout rootstock, having leaves lanceolate, obtuse, eciliate, without any apical callus and never adpressed.

It is perhaps closest to *E. albertiniana* Williams which however is a fairly diffuse shrub, single-stemmed at base with leaves sometimes adpressed and with a small apical callus. It differs from *E. laevigata* Turcz. which has leaves subcomplicate, orbicular and spreading and is found growing upon limestone to the east of Bredasdorp.

SPECIMENS EXAMINED

CAPE—3419 (Caledon): Witkoppies near Awila, Bredasdorp Division

(-DA), 100 ft., 2/8/1973, *Williams 1834* (NBG); Awila near Strandskloof, Bredasdorp Division, 175 ft., 29/8/1971, *Williams 1518* (NBG), 150 ft., 9/9/1976, *Williams 2203* (NBG); limestone hills near Gansbaai, Bredasdorp Division, -/1/1948, *Lewis 3097* (SAM); Baardscheedersbosch, Bredasdorp Division, 25/1/1948, *Barker 5308* (BOL); Hagelkraal River, Bredasdorp Division, 27/12/1946, *Leighton 2544* (BOL); Groothagelkraal, Bredasdorp Division, 200/400 ft., 24/4/1978, *Williams 2488* (NBG), 400 ft., 28/4/1975, *Oliver 5893* (STE); Elim/Uintjieskuil, Bredasdorp Division, 600 ft., 30/1/1973, *Williams 1754* (NBG); Elim, Bredasdorp Division (-DB), 400 ft., 18/4/1896, *Schlechter 7620* (BM, G, GRA, K, P), 500 ft., 22/4/1896, *Schlechter 7684* (BOL, PRE), 21/6/1972, *Williams 1655* (NBG); Klein Blomfontein, Bredasdorp Division, 300 ft., 15/1/1968, *Van Breda & Admiraal 2303* (K); south slopes Bredasdorp Mountains, Boskloof, 800 ft., 16/11/1972, *Williams 1734* (NBG); Rietfontein Poort, Bredasdorp Division, 150 ft., 11/1/1972, *Williams 1625* (NBG); Soetanysberg above Suur en Soet, Bredasdorp Division, 350 ft., 29/3/1971, *Oliver 3362* (STE); Soetanysberg above Hangnes, 600 ft., 25/5/1978, *Williams 2506* (NBG); sandy slopes at foot of low mountain at Brandfontein, Bredasdorp Division (-DD), 13/10/1951, *Esterhuysen 19016* (BOL, K, LD, NBG).

—— 3420 (Bredasdorp): in collibus prope Bredasdorp (-CA), 300 ft., -7/1895, *H. Bolus 8477* (BOL), *8471* (K); Nachtwacht near Jantjiesbosch, Bredasdorp Division, 150 ft., -/6/1927, *Smith 4290* (K); Voelklip/Graslaagte, Heidelberg Division (-BD), 200 ft., 27/10/1972, *Williams 1715* (NBG); Rondekop above Melkhoutkraal, 600 ft., 22/3/1975, *Oliver 5778* (STE).

—— 3421 (Riversdale): stony hillside above coast at Puntjie, Riversdale Division (-AC), 18/5/1950, *Esterhuysen 16971* (BOL); Puntjie, sand and limestone hills near coast, 24/1/1961, *Esterhuysen 28753* (BOL); Puntjie, Duiwenhoks River Mouth, 200 ft., 3/9/1973, *Boucher 2229* (PRE); 6,7 miles S.E. of Vermaaklikheid P.O., Riversdale Division, 500 ft., 29/7/1962, *Acocks 22529* (K, PRE); 16 miles S. of Riversdale, 400 ft., 28/7/1968, *Acocks 24011* (K, PRE); Still Bay hills, Riversdale Division, 9/8/1949, *Morris 264* (BOL).

—— 3422 (Mossel Bay): Mossel Bay (-AA), -/6/1928, *Salter 371/3* (BM), -/1/1913, *Bro. Moran s.n.* (BOL, PRE, SAM); in campis prope Mossel Bay, -/4/1899, *Bourne s.n.* (SAM *14095*); sandy hills near the landing place, Mossel Bay, 18/10/1814, *Burchell 6239* (K); macchia near Golf Course, Mossel Bay, 7/8/1936, *Lindeberg s.n.* (LD *83*); hillside along National Road towards George, Mossel Bay Division, 18/1/1964, *Esterhuysen 30608* (BOL); Great Brak River, fixed dunes, George Division, 1/6/1952, *Compton 23541* (BOL); Botha's Strand, 3 km east of Great Brak River Mouth, George Division, 200 ft., 29/10/1971, *Williams 1568* (NBG); Herolds Bay, George Division, 250 ft., 19/6/1977, *Williams 2310* (NBG).

Note: the locality "Genadendal 4 000 ft.", 31/12/1896, *Schlechter 9875* (BM, E, G, GRA, K, P, PH, S, W) is extremely doubtful.

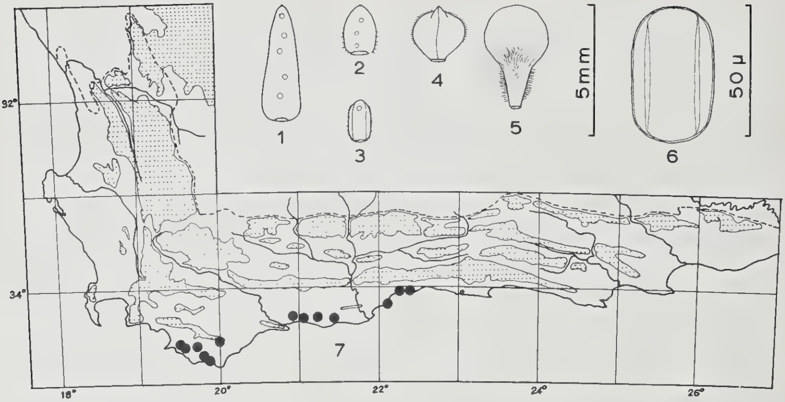

FIG. 3.
Euchaetis burchellii: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, pollen. 7, distribution.

5. **Euchaetis scabricosta** Williams in Jl S. Afr. Bot. **40** (4): 286 (1974). Type: CAPE—3420 (Bredasdorp): Potberg, sandy flats on south side of mountain, 3 km from Potberg Farm, Bredasdorp Division (-BC), 19/9/1972, *Williams 1689* (NBG, holotype).

Euchaetis scabricosta is a distinct species having the disc closing over the ovary at first, having fruits with horns not deeply cleft, and having leaves not gibbous behind the apex, opposite and with the midrib prominent, gland-stepped or scabrous.

It differs from *E. burchellii* which has leaves sessile with two rows of gland dots to either side of the midrib, and fruits with shorter horns. It differs from *E. meridionalis* which has a midrib with fewer gland dots, leaves more obtuse, more crowded, shorter and broader, with a resinous exudate towards the leaf axils. *E. scabricosta* is found growing in sandy ground and *E. meridionalis* upon a limestone formation.

6. **Euchaetis meridionalis** Williams in Jl S. Afr. Bot. **44** (4): 329 (1978). Type: CAPE—3420 (Bredasdorp): De Hoop behind sand dunes on track to Koppie Alleen, Bredasdorp Division (-AD), 14/4/1972, *Williams 1644* (NBG, holotype).

Euchaetis meridionalis is recognised as distinct having the disc closing over the ovary at first, the fruit 5-carpellate with the horns not deeply cleft, and leaves broadly lanceolate, sub-complicate, glabrous, opposite or alternate on the same plant and not gibbous behind the apex. It differs from *E. scabricosta* having a midrib with fewer gland dots, leaves more obtuse, more crowded, shorter and broader, with a resinous exudate towards the leaf axils. *E. meridionalis* is found growing only upon limestone whereas *E. scabricosta* grows in sandy soil.

7. **Euchaetis intonsa** Williams in Jl S. Afr. Bot. **44** (4): 335 (1978). Type: CAPE—3420 (Bredasdorp): north side of pass from Wydegelegen to De Hoop, at base of limestone hills, on gently sloping ground in crevices and in shallow soil on limestone bedrock (-AD), 100 m (350 ft.), 3/8/1975, *Williams 2028* (NBG, holotype; K, MO, NSW, PERTH, PRE, S, STE, isotypes).

Euchaetis intonsa is a distinct species having leaves alternate, elliptic, sparsely pubescent and ciliate, with bracts, bracteoles and calyx lobes pubescent and with petals small with the midrib glabrous inside.

It differs from *E. burchellii, E. laevigata* and *E. scabricosta* which have opposite leaves, glabrous bracts and glabrous calyx lobes. Although *E. meridionalis*, a more glabrous plant, is found nearby and may have 4 or 5-ranked leaves, it differs from *E. intonsa* which has smaller, sparsely pubescent leaves and pubescent bracts, bracteoles and calyx lobes.

8. **Euchaetis ericoides** Dümmer in Kew Bull.: 91 (1912). Type: without precise locality, received Sept. 1860, *Admiral Sir F. Grey* (K, holotype).

The fact that no locality was given with Admiral Grey's collection of this plant presented some difficulty and it was only after the type specimen had been received on loan from Kew that any comparison could be made with material in local herbaria. Fortunately the type was found to exactly match a speciman of *Euchaetis*, amongst the *incertae* at the Bolus Herbarium, collected by Miss Esterhuysen in 1953 at Schoongezicht Peak. This rather uncommon plant is to be found only in the mountains of the upper reaches of the Olifants River in the Clanwilliam Division and has been seldom collected. The following description (based upon *Williams 2294*) amplifies that given by Dümmer, in Latin, in the *Kew Bulletin*.

Shrubs 700 mm tall, fairly erect, slender, diffuse, single-stemmed at base. *Branches* somewhat erect, straight, smooth, glabrescent, without order. *Branchlets* spreading-erect, very slender, thinly and minutely puberulous, alternate or occasionally on young plants opposite, not hidden by the leaves. *Leaves* 6,5–12 mm long, 1,7–2,2 mm broad, lanceolate, acute, straight or sub-secund or subfalcate, glabrous, sub-glaucous, erect or somewhat spreading, alternate or opposite, sessile; apex with a small blunt callus; margins narrowly translucent and serrulate with numerous minute gland dots nearby; adaxial surface flat and smooth; abaxial surface fairly flat with 2 parallel rows of small gland dots along the midrib. *Inflorescence* terminal, normally 3-nate but if leaves opposite then 4-nate; flowers 5 mm diam., white. *Bract* one per flower, 2,7–3,5 mm long, 1,3 mm broad, lanceolate, sub-glaucous: apex with a blunt callus; margins subserrulate above, ciliolate and translucent below; adaxial surface thinly puberulous; abaxial surface glabrous, with a fairly prominent gland-dotted midrib. *Bracteoles* two, 2,5 mm long, 1,2 mm broad, ovate-lanceolate, apex thickened with a blunt callus; margins broadly translucent and ciliolate; adaxial surface puberulous; abaxial surface glabrous, sub-glaucous. *Calyx lobes* five, 2,8–3,1 mm long, 2 mm broad, oblong-elliptic, obtuse, apex with a small blunt elevated callus, margins ciliate and very broadly translucent; abaxial surface pubescent towards the middle; adaxial surface glaucous, glabrous, midrib obscurely gland-dotted. *Petals* five, 5 mm long overall; *limb* 2 mm long, 2 mm broad, orbicular, apiculate-retuse, strongly recurved, white; margin minutely serrulate; *claw* 3 mm long, 1,2 mm broad, strongly transversely bearded above extending mainly down the prominent midrib; margins ciliate. *Staminodes* five, vestigial, a minute green gland at most 0,1 mm long. *Filaments* five, becoming 1,7 mm long after anthesis, subulate, glabrous. *Anthers* five, before anthesis 1 mm long, 0,7 mm broad, wine-coloured; apical gland small oblong-globose. *Pollen* 50 μ long, 30 μ broad, oblong. *Disc* exceeds the ovary by a long way, closing over it slightly, level on top, green, fleshy. *Stigma* 0,6 mm diam., capitate, depressed globose, green. *Style* becoming 1,5 mm long, erect, glabrous. *Ovary* 5-carpellate, 0,8 mm long, 0,8 mm diam., apices minutely scabrid. *Fruit* 5-carpellate, 9,5–10 mm long, 5 mm diam., glabrous, each carpel with a conspicuous wine-coloured stripe down the midrib and with, to either side, margins bearing a gland-dotted ridge; *horns* about 4 mm long, erect with apex retuse and minutely scabrid. *Seed* 5–6 mm long, including a white aril 1,5 mm long, 1,8–2,2 mm broad, black not shining (partly from *Esterhuysen 21277*).

Euchaetis ericoides is recognised as distinct because of having leaves that are rather flat with a tendency to curl upwards, i.e. sub-secund. Other distinguishing characters are: the disc closes over the ovary at first, the fruit is 5-carpellate with horns not cleft at the apex, the leaves are lanceolate, fairly flat, glabrous, opposite or alternate and not gibbous behind the apex.

SPECIMENS EXAMINED

CAPE—3219 (Wupperthal): Schoongezicht Peak, Cold Bokkeveld Mountains, Ceres Division (-CC), –/4/1939, *Stokoe 7673* (BOL), 3 500–4 500 ft., 4/4/1953, *Esterhuysen 21277* (BOL), 5/4/1953, *Stokoe s.n.* (SAM *67228*), 17/9/1949, *Hanekom 1232* (PRE); lower slopes of Olifants River Mountains at Thee River, Clanwilliam Division, 17/4/1949, *Esterhuysen 15338* (BOL); Keerom, stony west slopes of Cold Bokkeveld Mountains above Olifants River valley, Clanwilliam Division, 4/12/1950, *Esterhuysen 17919* (BOL), 1 900 ft., 24/3/1977, *Williams 2294* (NBG); Cardouw Pass, east slopes, Clanwilliam Division, 15/9/1953, *Barker 8126* (NBG), *Lewis 4138* (SAM).

Without precise locality: *Admiral Sir F. Grey* (K).

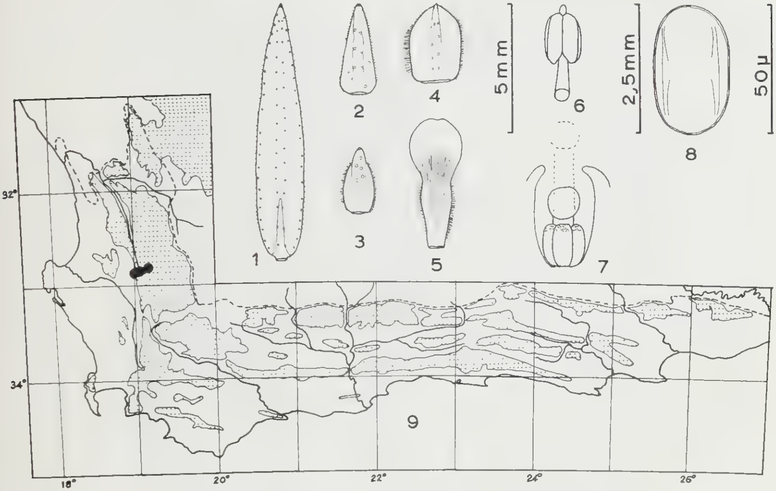

FIG. 4.
Euchaetis ericoides: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, anther. 7, gynoecium and disc. 8, pollen. 9, distribution.

9. **Euchaetis tricarpellata** Williams in Jl S. Afr. Bot. **41** (4): 241 (1975). Type: CAPE—3218 (Clanwilliam): south from the summit of Versvelds Pass, Piquetberg Division (-DC), 640 m. 18/9/1972, *Williams 1690* (NBG, holotype).

Euchaetis tricarpellata is recognised as a distinct species because of its three-chambered ovary. All other species in the genus are 5-carpellate.

10. **Euchaetis vallis-simiae** Williams in Jl S. Afr. Bot. **45** (2): 156 (1979). Type: CAPE - 3323 (Willowmore): Baviaanskloof Forest Reserve at Studtis, on forestry road at end of first plateau (-DB), 915 m alt., 12/10/1976, *Williams 2224* (NBG, holotype; AD, B, BOL, K, L, M, MO, NSW, PRE, S, STE, isotypes).

Euchaetis vallis-simiae is recognised as distinct because of having prominently-nerved, elliptic leaves which, with the bracts, bracteoles and calyx lobes, are conspicuously gibbous behind the apex and scabro-tomentose on all sides.

It is also useful to note that the disc closes over the ovary at first and that the style is always erect and bears an unusually large stigma.

11. **Euchaetis cristagalli** Williams in Jl S. Afr. Bot. **45** (2): 147 (1979). Type: CAPE—3324 (Steytlerville): east of Cockscomb, Great Winterhoek Mtns., Uitenhage Division (-DB), 915–975 m alt., 9/3/1977, *Williams 2283* (NBG, holotype; BOL, K, L, MO, PRE, S, STE, isotypes).

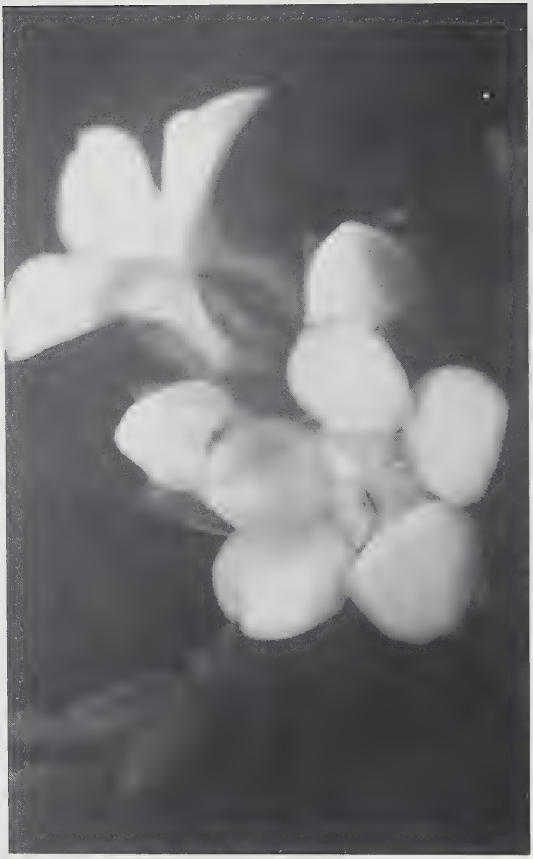

Fig. 5.
Euchaetis ericoides: flower showing bearded petals.

Euchaetis cristagalli is most easily recognised as distinct from other species of *Euchaetis* with linear-lanceolate leaves because of its having the longest petals. It has been observed that these petals very readily fall away. *E. cristagalli* may be distinguished from *E. elata* which has leaves sessile, pubescent on the adaxial surface, and flowers sessile ± 3-nate, with the style at some time deflexed; from *E. glomerata* which has broader leaves and smaller flowers in multiflorous heads; from *E. flexilis* which has leaves with sacculate apices and broad translucent margins.

It is perhaps nearest in appearance to *E. linearis* which however has leaves with only two rows of gland dots, flowers in many flowered heads with small petals and a disc that stands open, not obvallate.

12. **Euchaetis avisylvana** Williams in Jl S. Afr. Bot. **44** (4): 339 (1978). Type: CAPE—3320 (Montagu): Grootvadersbos, on a stony south facing shoulder, Heidelberg Division (-DD), 425 m (1 400 ft.) alt., 29/4/1975, *Williams 1997* (NBG, holotype; BOL, C, GRA, K, M, MO, NSW, PERTH, PRE, S, STE, isotypes).

Euchaetis avisylvana is distinct on account of having villous-ciliate leaves tipped with a few hairs at the apex; lanceolate-acute, white, somewhat petal-like calyx lobes and acute petals. It differs from *E. elata* E. & Z. which has leaves, bracts, bracteoles and calyx lobes much shorter and ciliate, not villous-ciliate, and also the blade of the petal elliptic-apiculate not lanceolate-acute.

The very short horns on the fruit of *E. avisylvana* at once distinguish it from *E. longicornis* Williams which has leaves, bracts, bracteoles and calyx lobes with very sharp points and with gland dots scattered and not in two straight rows. *E. avisylvana* has been found only in a few places on the south slopes of the Langeberg from Tradouw Pass eastwards for about 17 km at altitudes of from 300–600 m.

13. **Euchaetis elata** Ecklon & Zeyher, Enum. Plant.: 104 (1835). Type: In lateribus montium "Hottentotshollandsberge" (altit. 4) prope villam "Grietjesgat" non procul a flumine "Palmietrivier" (Stellenbosch), Jun., *Ecklon & Zeyher 819* (SAM, lectotype; C, MEL, S, W, isotypes).

As no specific specimen was indicated in the type description, the collection housed in the South African Museum herbarium at Kirstenbosch, South Africa, has been chosen as the lectotype.

Shrubs up to 1 m tall, slender, standing somewhat above the surrounding Restionaceae, not much branched, single-stemmed at base. *Branches* few in number, rod-like, erect, glabrous, with a smooth grey-brown bark. *Branchlets* few, straight, erect, slender, glabrous, yellowish, well-clothed with leaves. *Leaves* 6–8 mm long, 1–1,3 mm broad, linear-lanceolate, acute, incurved-mucronate, sessile, erect, adpressed, usually not imbricate, alternate; adaxially concave above and pubescent with short bristly hairs bent towards the apex; abaxially convexo-carinate, glabrous with two rows of gland dots; hyaline margins narrow, minutely ciliolate. *Inflorescence* terminal without any involucre, with groups of about three sessile florets at the end of the main stem and at the ends of very short branchlets crowded together, those at the apex being the first to bloom. *Bract* one per floret, 2,5 mm long, 1 mm broad, lanceolate, acute, mucronate, hyaline margins ciliolate; adaxially concave, sparsely short-pubescent above; abaxially convexo-carinate, glabrous with two rows of gland dots. *Bracteoles* two, 2,2 mm long, 0,8 mm broad, similar to the bract. *Calyx lobes* five, 2,5 mm long, 1,2 mm broad, oblong, acute, with a small callus at the apex; margins ciliolate, broadly translucent becoming rolled inwards towards the apex; adaxially somewhat pubescent; abaxially glabrous with two rows of gland dots. *Petals* five, 3,8 mm long overall; *limb* 1,3 mm broad, elliptic, minutely apiculate, white, gland-dotted; *claw* 2 mm long, 0,7 mm broad, narrowing below, strongly transversely bearded above, ciliate. *Staminodes* not visible except as a round spot on the disc. *Filaments* five, becoming 1 mm long, subulate, glabrous. *Anthers* five, 0,8 mm long, 0,7 mm broad, plum-coloured; apical gland minute, inflexed. *Pollen* 40 μ long, 20 μ diam., oblong, surface rough-dotted. *Disc* exceeds the ovary, exudes nectar. *Stigma* capitellate, much the same diam, as the style. *Style* at first deflexed, becoming erect, 1,3 mm long, slender, glabrous. *Ovary* 5-carpellate, 0,7 mm diam., glabrous, apices globose. *Fruit* 5-carpellate, 5,5 mm long, 5 mm diam., glabrous, smooth, gland-dotted; horns 0,5–1 mm long. *Seed* 3,8–4 mm long, 2 mm broad, black, shining; aril black.

Euchaetis elata is recognised as distinct having the disc obvallate, surrounding the ovary but neither closing over it nor spreading, having flowerheads without conspicuous involucral leaves as in *E. longibracteata*, with the flowers opening first at the apex of the inflorescence, having the style at some stage deflexed, with petals obtuse 3,8 mm long, not as long as 5,5 mm in *E. cristagalli*, having leaves linear-lanceolate, inflexed, obtusely mucronate, not flat, with margins ciliolate or crisped ciliate, not villous ciliate as in *E. avisylvana*, and having fruits with horns less than 1 mm long not 3,5 mm long as in *E. glomerata*. The leaves of *E. linearis* are seen to differ in having more numerous gland dots that are also very much smaller in diameter, and the leaves of *E. flexilis* clearly differ in their sacculate apices.

SPECIMENS EXAMINED

CAPE—3319 (Worcester): Slanghoek mountains, Cossacks, Worcester Division (-CA), 4 000 ft., 7/3/1943, *Esterhuysen 8626* (BOL); Slanghoek mountains, Witteberg, Worcester Division, 21/11/1943, *Esterhuysen 9494* (BOL), 5 000 ft., 13/11/1949, *Esterhuysen 16523* (BOL); Slanghoek Pile, shale band, Worcester Division, -/1/1940, *Esterhuysen 1728* (BOL); upper Wellington Sneeuwkop, shale band, Paarl Division, 5 000 ft., 8/1/1943, *Esterhuysen 8645* (BOL), 9/1/1949, *Esterhuysen 15038* (BOL); Du Toits Kloof, 3 500 ft., 7/6/1897, *A. Bolus s.n.* (BOL, *Guthrie 4680*): Haalhoeksneeuwkop, Paarl Division (-CC), -/4/1942, *Stokoe s.n.* (SAM *59351*), -/4/1942, *Esterhuysen 7714* (BOL, SAM).

—— 3418 (Simonstown): In lateribus montium Hottentotshollandsberge procul villam Grietjesgat non procul a flumine Palmietrivier, Caledon Division (−BB), 1 500–2 000 ft. alt., -/6/-, *Ecklon & Zeyher 819* (SAM, C, MEL, S, W); between Sir Lowry's Pass and Elgin, 12/4/1941, *Compton 10660* (NBG); Kogelberg, S.E. slopes, 3 000–4 000 ft., 16/1/1944, *Esterhuysen 9990* (BOL); Kogelberg Forest

Reserve boundary with Somersfontein, 274 m, 15/4/1970, *Boucher 1230* (STE); Arieskraal, west side of Palmiet River, rocky places, 800 ft., 12/2/1973, *Williams 1757* (NBG); Palmiet River, Oudebos (-BD), 19/4/1966, *Esterhuysen 31523* (BOL).

—— 3419 (Caledon): Elgin, Caledon Division (-AA), 24/4/1943, *Compton 14488* (BOL, NBG); Palmiet River, Elgin, 28/2/1942, *Stokoe 8497* (BOL, K, NBG, SAM *59349*), -/1/1943, *Stokoe 8498* (BOL, K); Palmiet River, Grabouw, -/12/1942, *Stokoe* (SAM *59348*); mountain slopes east and west of Palmiet River, Elgin, 25/4/1943, *Leighton 313* (BOL, K); Viljoens Pass, south side, -/8/1946, *Sidey 2405* (S), -/8/1946, *Stokoe s.n.* (S, SAM *59347*), 1 650 ft., 15/4/1975, *Williams 1996* (NBG); Hottentotsholland Mtns., between Somerset Sneeuwkop and Dwarsberg, -/9/1946, *Stokoe s.n.* (G, SAM *59346*).)

DISTRIBUTION AND VARIATION

Euchaetis elata appears to have a north-south distribution in the mountains of the south west Cape, extending from near the mouth of the Palmiet River in the Caledon Division northwards to the Slanghoek mountains in the Worcester Division a distance of about 8 km at altitudes varying from about 200 to 1 500 metres.

Towards the north, where the populations occur at higher altitudes, plants appear to have broader distinctly petiolate leaves with the margins becoming crisped ciliate; on the broadest leaves two extra rows of gland dots appear along the margins, one to either side. Young leaves become decidedly pubescent in the most northerly populations and the sparse pubescence on the adaxial surface of the leaves seems to disappear.

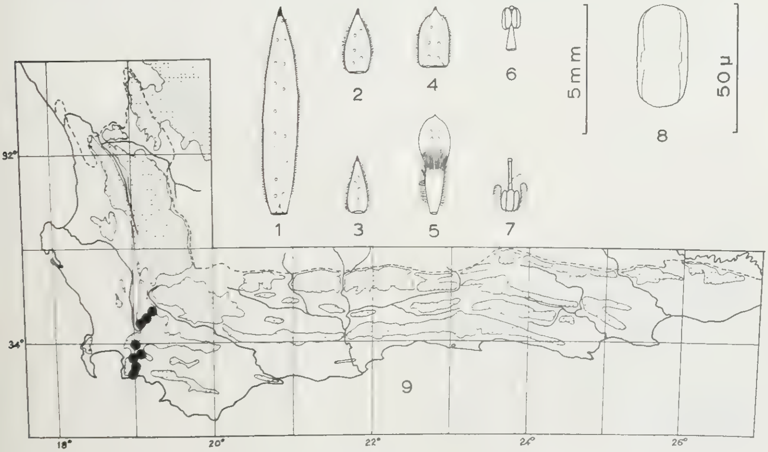

FIG. 6.
Euchaetis elata: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, anther. 7, gynoecium and disc. 8, pollen. 9, distribution.

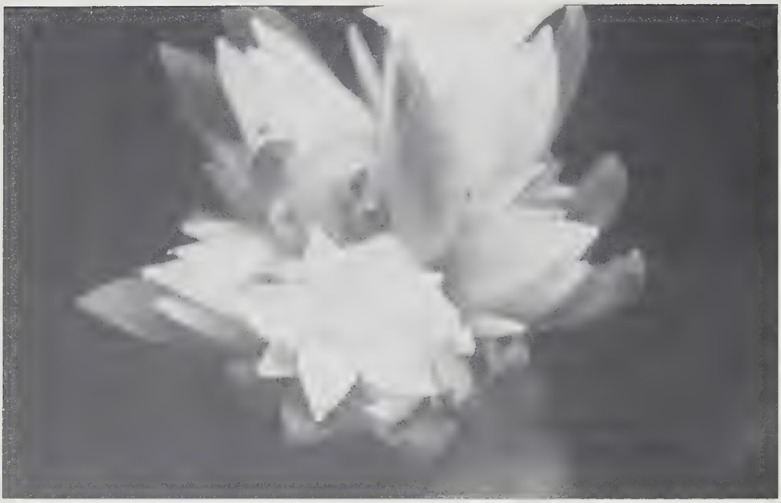

FIG. 7.
Euchaetis elata: flowerhead showing youngest flowers at the perimeter.

14. **Euchaetis glomerata** Bartling & Wendland, Diosmeae in Beitr. Bot. **1**: 16 (1824). Type: ad Cap. b. Spei, *Hesse* (GOET-BARTL, lectotype; GOET, isotype, as to specimen no. 2 on R.H. side).

Euchaetis abietina Eckl. & Zeyh., Enum. Plant.: 104 (1835). Type: in nemoribus (alt. 1 500–2 000 ft.) ad montes "Cederberge" (Clanwilliam), -/6/-, *Ecklon & Zeyher 821* (C, G, GOET, K, MEL, P, PRE, SAM, W).
Diosma glomerata G. F. W. Mey. mss. nom. nud.

As this was the only species of *Euchaetis* known to Bartling and Wendland when they proposed the new genus *Euchaetis* in 1824, it must be regarded as the type species of the genus. The specimen in Bartling's herbarium which he received in 1820 is chosen as the lectotype and another rather more typical twig received in 1836 from G. F. W. Meyer is therefore an isotype. The following description made from fresh material complements the very detailed description in Latin of Bartling & Wendland.

Shrubs 0,2–0,4 m tall, lax, diffuse, growing amongst Restionaceae, often branching from near the base. *Branches* slender, lax, seldom numerous, soon leafless, smooth, greyish to reddish-brown. *Branchlets* erect, very slender, rodlike, glabrous, mostly hidden beneath the leaves, reddish where exposed. *Leaves* 4,3–8,5 mm long, 1,3–1,7 mm broad, lanceolate, acute, somewhat incurved mucronate, glabrous, sessile, alternate, adpressed, sub-imbricate, more crowded beneath the head; adaxially concave; abaxially round-keeled with gland dots to either side of the midrib; margins narrowly translucent, ciliate or ciliolate-serrulate with occasionally one or two gland dots. *Inflorescence* terminal, about 8 mm diam., glomerate consisting of up to ± 15 florets, those at the apex opening latest, those at the base aborting and falling away. *Bract* 1,9–2,5 mm long, 1,1 mm broad, oblanceolate, acute, mucronate, glabrous, gland-dotted; margins narrowly translucent, ciliate. *Bracteoles* two, 1,5–1,9 mm long, 0,7 mm broad, asymmetrical, acute or sub-obtuse, apex minutely callused, glabrous, gland-dotted; margins broadly translucent, ciliolate. *Calyx lobes* five, 2–2,5 mm long, 1,1–1,3 mm broad, oblong-lanceolate, apex acute deflected, minutely rough-callused; midrib minutely gland-dotted in two rows; margins ciliolate, translucent. *Petals* 2,7–2,8 mm long overall, white; *limb* 1,1–1,2 mm long, 0,6–1,0 mm broad, glabrous, oblong; *claw* 1,5–1,7 mm long, 0,9–1,2 mm broad, transversely bearded above, margins ciliate. *Staminodes* not visible. *Filaments* five, becoming 1–1,2 mm long, glabrous, acicular. *Anthers* five, 0,7–0,9 mm long, 0,6–0,7 mm broad, wine-coloured; apical gland minute, white, globose. *Pollen* 45 μ long, 18 μ broad, oblong, slightly waisted. *Disc* sinuate, level on top, closely surrounds the ovary and exceeds it, purplish, exudes nectar. *Stigma* 0,2–0,3 mm diam., capitellate. *Style* becoming 1 mm long, deflexed at first, glabrous. *Ovary* 5-carpellate, 1,1 mm long, 0,8 mm diam., glabrous, apices globose. *Fruit* 5-carpellate, 8–12 mm long overall, 7 mm diam., glabrous, reddened; horns 2–4,5 mm long, spreading slightly. *Seed* 6 mm long, including the black-streaked aril, 2,1–2,7 mm broad, black, matt.

E. glomerata is recognised as distinct having the disc obvallate, neither closing over the ovary nor spreading, having the style at some stage deflexed and petals obtuse only 2,8 mm long, having leaves lanceolate, acute, sessile, adpressed, with margins serrulate and rigidly ciliate, and having fruits with horns 3,5 mm long. In the flowerheads the first flowers open at the base of the head and the last at the apex. The opposite occurs in *E. elata*. It possesses no conspicuous involucral leaves as in *E. longibracteata*, the leaves are not villous ciliate as in *E. avisylvana* and not sacculate at the apex as in *E. flexilis*.

SPECIMENS EXAMINED

CAPE—3219 (Wupperthal): Pakhuis mountains, Clanwilliam Division (-AA), 28/12/1941, *Esterhuysen 7409* (BOL); Cedarberg near Krakadouw Pass, 3 000 ft., 8/10/1897, *Bodkin s.n.* (BOL *8955*); Cedarberg, Middelberg (-AC), 4 000 ft., 24/9/1930, *Barnes s.n.* (BOL *19474*), 16/12/1941, *Esterhuysen 7281* (BOL), 15/12/1941, *Esterhuysen 7364* (BOL, NBG), 3/1/1942, *Esterhuysen 7600* (BOL), 6/10/1946, *Esterhuysen 13022* (BOL), 25/9/1937, *Lewis s.n.* (BOL), 4 000 ft., 25/9/1937, *Compton 7044* (BOL, NBG), 2 500 ft., 18/5/1966, *Taylor 6833* (PRE); Cedarberg, Boschkloof, 4 000 ft., 14/10/1923, *Pocock 239* (STE); Cedarberg, *Zeyher s.n.* (S), –/11/1939, *Stokoe 7608* (BOL); Cedarberg, shale band w. side of path to Tafelberg, 4 000 ft., 24/4/1942, *Esterhuysen 8080* (BOL);

in nemorosis ad Cedarmountains, Clanwilliam, 1 500–2 000 ft., *Ecklon 1035* (= *E. & Z.821)* (C, G, GOET, K, MEL, P, PRE, S, SAM, W); Cedarberg, upper slopes near Algeria, 24/10/1930, *Galpin 10580* (PRE), –/3/1940, *Stokoe s.n.* (SAM *58832*); Cedarberg, N.W. end of Langeberg, 5 300 ft., 15/2/1973, *Williams 1765* (NBG); Sneeuwberg hut area, 4 500–5 000 ft., *Taylor 5129* (PRE), 4 250 ft., 1/12/1976, *Williams 2248* (NBG); Sneeuwberg shale band, 5 500 ft., 16/5/1966, *Taylor 6820A* (STE); south slope of Elandskloof, Clanwilliam Division (-CA), 4 000 ft., 3/10/1940, *Esterhuysen 3148* (BOL, NBG); Donkerkloof Peak, near Citrusdal, –/1/1945, *Stokoe 9143* (BOL, SAM *59342*); S. Cedarberg, shale band E. of Sneeuwberg, 5 000 ft., 10/10/1946, *Esterhuysen 13079* (BOL); S. Cedarberg, shale band at head of Krom River kloof, 5 000 ft., 11/12/1950, *Esterhuysen 18032* (BOL); Baths Mountains, Clanwilliam Division, 2 000 ft., 8/7/1935, *Compton 5376* (NBG); Cedarberg, Duivelskloof, –/9/1950, *Stokoe s.n.* (SAM *64145*); Apex Peak, S. Cedarbergen, 3 000–4 000 ft., 1/4/1961, *Esterhuysen 28946* (BOL); S. Cedarberg, ridge S. of Krom River (-CB), 3 600 ft., 18/9/1975, *Williams 2084* (NBG), 4/10/1952, *Esterhuysen 20502* (BOL); Schoongezicht Peak, Ceres Division (-CC), –/4/1939, *Stokoe 7672* (BOL), 3 500 –4 500 ft., 4/4/1953, *Esterhuysen 21295* (BOL), –/4/1939, *Stokoe s.n.* (SAM *54205*), 5/4/1953, *Stokoe s.n.* (SAM); Vredelus, E. base of Schoongezicht Peak, 2/9/1962, *Esterhuysen 29673* (BOL), 21/4/1973, *Esterhuysen 33171* (BOL); lower slopes of mountains at Thee River, 17/4/1949, *Esterhuysen 15337* (BOL); Keerom, stony W. slopes, 4/12/1950, *Esterhuysen 17918* (BOL), 1 900 ft., 24/3/1977, *Williams 2299* (NBG).

——3319 (Worcester): slopes of Witsenberg, Tulbagh Division (-AA), –/9/1939, *Esterhuysen 2640* (BOL, K); Sneeuwgat, Great Winterhoek Mountains, Tulbagh Division, 4 000–5 000 ft., 30/12/1951, *Esterhuysen 19749* (BOL); Saronsberg, Tulbagh Division, 2 000–2 500 ft., 17/1/1965, *Esterhuysen 30933* (BOL); Twenty-four Rivers Mountains above Porterville, Piketberg Division, 22/10/1949, *Esterhuysen 16412* (BOL, K); Witsenberg Vlakte a few miles before Visgat, Ceres Division, 2 000–3 000 ft., 11/1/1960, *Esterhuysen 28402* (BOL); Cold Bokkeveld Mountains near Visgat, 16/12/1946, *Esterhuysen s.n.* (BOL); Visgat, 913 m, 15/5/1975, *Williams 1998* (NBG); Boboskloof, ridge S. of ruin, 980 m, 22/11/1975, *Williams 2149* (NBG); rocky slopes in Schurfteberg Pass, Ceres Division (-AB), 30/7/1950, *Esterhuysen 17378* (BOL, NBG); Ceres Peak, slopes above Michells Pass (-AD), 24/5/1941, *Esterhuysen 5198* (BOL, NBG); Slab Peak, Michells Pass, 4 000 ft., 5/10/1941, *Esterhuysen 6171* (BOL, NBG); slopes below Castle Rocks, Michells Pass, 16/11/1947, *Esterhuysen 14149* (BOL), 5/12/1948, *Esterhuysen 14713* (BOL), 9/11/1952, *Esterhuysen 20709* (BOL); Michells Pass, half a mile from the summit, 1 600 ft., 20/3/1975, *Williams 1984* (NBG); W. of the summit of Michells Pass, 1 900 ft., 15/5/1975, *Williams 2001* (NBG); Ezelsfontein, rocky lower slopes of Milner Peak, 1/9/1952, *Esterhuysen 20363* (BOL); Schurfteberg, N. of Bertsberg, 8/10/1953, *Esterhuysen 21865* (BOL).

DISTRIBUTION AND VARIATION

Euchaetis glomerata has been found growing in soil derived from the Table Mountain Sandstone in stony or rocky places from Pakhuis Mountain near Clanwilliam in the north to the vicinity of Michells Pass near Ceres in the south, a distance of about 145 km, at altitudes of from 488 to 1 676 m (1 600 to 5 500 ft.) above sea level. Flowering appears to take place throughout the year and ripe fruits have been collected from September until February.

Some variation can be seen in leaf size. Populations with smaller leaves appear to have the bracts and calyx lobes more obtuse. Plants from the Wemmershoek/Slanghoek mountains once thought to belong to this species are apparently quite different having leaves petiolate much broader and more crowded with ciliate margins.

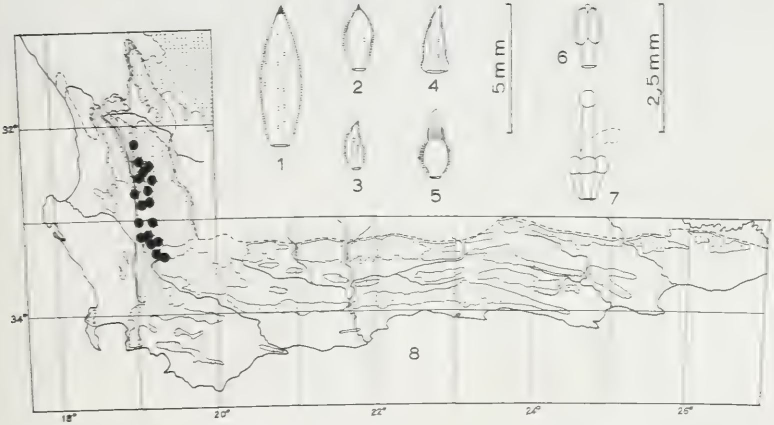

FIG. 8.
Euchaetis glomerata: 1. leaf. 2. bract. 3. bracteole. 4. calyx lobe. 5. petal. 6. anther. 7. gynoecium. 8. distribution.

15. **Euchaetis flexilis** Ecklon & Zeyher. Enum. Plant.: 105 (1835). Type: Ad montem "Baviaansberg" prope "Genadenthal" (altit. 1 500–2 000 ft.) Caledon. – 7 –. *Ecklon & Zeyher 822* (SAM, lectotype; C, MEL, S, isotypes).

Euchaetis roilophylla Schltr. nom. nud.

The mission station at Genadendal in the Caledon District was a favourite stopping place for travellers in the early days and it was here that *E. flexilis* was first discovered by Ecklon or Zeyher. As the whereabouts of the actual specimen used by the authors in their description is unknown, a specimen preserved in the herbarium of the South African Museum at Kirstenbosch is now chosen as the lectotype of *Euchaetis flexilis* E. & Z.

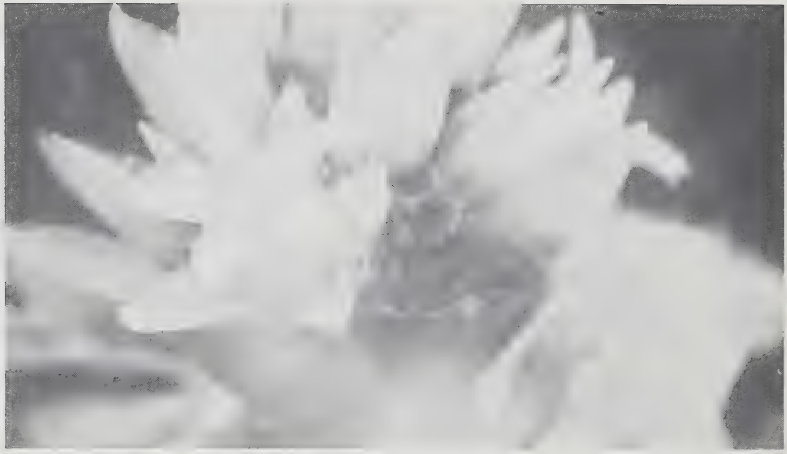

Fig. 9.
Euchaetis glomerata: flowerhead showing youngest flowers at the apex.

Shrubs 0,2–0,4 m tall, slender, branching from near the base, may survive fires. *Branches* slender, lax, glabrous, smooth. *Branchlets* very slender, somewhat erect, well-clothed with leaves. *Leaves* 4–6 mm long, 1,5–2,3 mm broad, oblong-elliptic, obtuse, glabrous, adpressed to imbricate, opposite or alternate, sessile; apex sacculate; margins minutely ciliolate and broadly translucent; adaxial surface concave; abaxial surface rounded, conspicuously gland-dotted. *Inflorescence* terminal, with about 6 florets in a reduced compound raceme; *flowers* about 5 mm diam., white. *Bract* one to each flower, 2,8 mm long, 1,6 mm broad, elliptic, obtuse, glabrous; margins ciliolate, broadly translucent. *Bracteoles* two, 2 mm long, similar to the bract but smaller. *Calyx lobes* five, 2–2,5 mm long, 1,5 mm broad, elliptic, obtuse, reddened, gland-dotted; margins ciliolate, broadly translucent. *Petals* five, 3,2–3,6 mm long, 1,3–1,8 mm broad, cuneate-obtuse, white, transversely bearded and ciliate in the middle, narrowing below to 0,5 mm at the base. *Staminodes* five, vestigial, a minute almost submerged hemispherical dot. *Filaments* five, becoming 1 mm long, glabrous. *Anthers* five, about 1 mm long before anthesis; apical gland 0,12 mm diam., minute. *Disc* sinuate, red, exudes nectar, fairly level on top, exceeds the ovary by a small amount. *Stigma* 0,2 mm diam., depressed globose, capitellate. *Style* glabrous, at first deflexed, becoming 1,2 mm long, erect after the petals have fallen at which stage unfertilised flowers fall off. *Ovary* 5-carpellate, carpels ovoid obtuse, glabrous. *Fruit* 5-carpellate, 4,5 mm long, 4,2 mm diam., carpels glabrous, reddened, without gland dots, 2-ribbed towards the apex; horns 0,7 mm long, very short, dark red, somewhat spreading with an immersed gland towards the apex. *Seed* 2,8–3,2 mm long, 1,7–1,9 mm broad, black, shining; aril black.

Euchaetis flexilis is recognised as distinct having the disc obvallate not closing over the ovary and not spreading, having no involucral leaves, having the style at some stage deflexed, having petals only 3,6 mm long obtuse and having leaves obtuse with the apex sacculate with margins not villous ciliate but minutely ciliolate and broadly translucent. Sonder observed "easily known by its smaller leaves with a wide hyaline margin, laxer inflorescence, and more obtuse calyces & bracts".

SPECIMENS EXAMINED

CAPE—3319 (Worcester): du Toits Peak, N.E. ridge, Worcester Division (-CA), 3 000 ft., 6/10/1951, *Esterhuysen 18909* (BOL); Brandvalleiberg, Worcester Division (-CB), 2/6/1940, *Esterhuysen 1926* (BOL), *P. Bond 369* (NBG); Stettynsberg, E. slopes, Worcester Division (-CD), 3 000–4 000 ft., 31/7/1949, *Esterhuysen 15609* (BOL), -/7/1949, *Stokoe s.n.* (SAM *64142*); Jonaskop, between F.M. Tower and summit, Worcester Division (-DC), 5 200 ft., 15/3/1975, *Boucher 2734* (STE); N. slopes of Jonaskop near Radio Mast, 4 800 ft., 8/4/1971, *Kruger 1195* (STE); E. slopes of Wildepaardeberg, -/4/1920, *Andrae 341* (STE); Jonaskop N. side, 5 000 ft., 19/10/1971, *Esterhuysen 32688* (BOL); Road to Jonaskop, Wildepaardeberg, 3 400 ft., 19/10/1971, *Williams 1559* (NBG); Omklaar, Robertson Division, -/2/1940, *Stokoe 7674* (BOL).

—— 3419 (Caledon): On Donkerhoekberg, Caledon Division (-AB), 9/3/1815, *Burchell 7967* (K); Nooitgedacht, W. of Genadendal, 1 500 ft., 19/10/1976, *Williams 2228* (NBG); Genadendal in montibus, Caledon Division (-BA), 3 500 ft., 3/4/1897, *Schlechter 10324* (BM, BOL, G, GRA, K, PRE), 3 000 ft., 1/4/1897, *Schlechter 10295* (G, P, S); in monte Baviaansberg, Genadendal, –/7/–, *Ecklon and Zeyher 822* (SAM, lectotype; C, MEL, S, isotypes); in the ascent of the great mountain of Baviaanskloof at Genadendal, 15/2/1815, *Burchell 7653* (K, GRA, P, W); Skilpadkop, Riviersonderend Mtns., Caledon Division (-BA), 13/4/1941, *Compton 10670* (BOL, NBG), *Esterhuysen 5051* (BOL, K, NBG, SAM), 2 500–3 000 ft., 30/11/1952, *Esterhuysen 20783* (BOL), 3 000 ft., 2/1/1953, *Esterhuysen 21043* (BOL); Canonkop, Riviersonderend Mtns. above Genadendal, 3 500–4 000 ft., 21/2/1966, *Esterhuysen 31463* (BOL); Galgeberg near the Post Office Tower, Robertson Division, 4 500 ft., 2/5/1971, *Thompson 1152* (STE); Galgeberg, 3 500 ft., 23/3/1972, *Williams 1628* (NBG); Galgeberg summit, 4 600 ft., 4/2/1975, *Williams 1962* (NBG), 10/8/1975, *Williams 2040* (NBG); Riviersonderend, Caledon Division (-BB), -/4/1930, *Stokoe 2120* (BOL, STE), *2139* (BOL, K), 2 000 ft., -/9/1943, *Stokoe 8861* (BOL), 30/4/1950, *Middlemost 1666* (NBG), -/5/1950, *Lewis & Davis s.n.* (SAM *59353*); Riviersonderend Peak, 3 000–4 000 ft., 2/9/1951, *Esterhuysen 18750* (BOL, K, LD); Riviersonderend, Pilarkop, 900–1 000 m, 13/12/1965, *Dahlgren & Strid 4549* (K, LD, S), 3 000-4 000 ft., 17/11/1965, *Esterhuysen 31392* (BOL).

DISTRIBUTION

Euchaetis flexilis has been found mainly in the mountains of the Riversonderend Range from Donkerhoek in the west to Pilarkop above the town of Riviersonderend in the east with outliers extending into the Stettynsberg and the Du Toits Kloof mountains towards the north. It grows at altitudes of 600 to 1585 m (2 000 to 5 200 ft.).

VARIATION

In the centre of the distribution range on north-facing slopes in the vicinity of Jonaskop and Galgeberg, plants may be found with much broader leaves in which the gland dots are more conspicuous. These plants have been seen to be growing in rock crevices and this may be a factor affecting this odd character. R. Schlechter gave the manuscript name *E. roilophylla* to these plants.

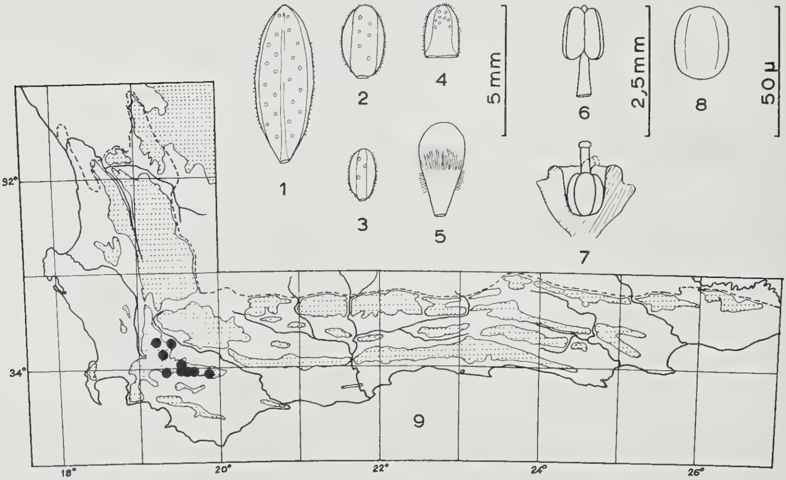

FIG. 10.
Euchaetis flexilis: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, anther. 7, gynoecium and disc. 8, pollen. 9, distribution.

16. **Euchaetis glabra** Williams in Jl S. Afr. Bot. **39** (3): 229 (1973). Type: CAPE—3418 (Simonstown): on a N.E. ridge of the Kogelberg, 5,3 km due south of Sir Lowrys Pass summit, Caledon Division (-BB), 807 m alt., 10/6/1962, *Williams 1654* (NBG, holotype; K, MO, M, PRE, S, STE, isotypes).

Euchaetis glabra is recognised as distinct on account of its having orbicular-elliptic petiolate leaves with thin margins and in its being completely glabrous.

17. **Euchaetis longibracteata** Schlechter in Bot. Jb. **24**: 438 (1898). Type: Western Cape: on stony hills near Elim, 80 m above sea level, flowering in April 1896, *Schlechter 7627* (BOL, lectotype; BM, K, P, PRE, W, isotypes). *Note*: see note on typification by Williams in Jl S. Afr. Bot. **40** (4): 281 (1974).

Euchaetis bolusii Dümmer in Kew Bull.: 90 (1912). Type: Cape Colony: Bredasdorp Division; on hills near Bredasdorp, 90 m, *Bolus 8473 (K)*.

Euchaetis radiata Dümmer in Kew Bull.: 91 (1912). Type: Cape Colony: Bredasdorp Division; on hills near Elim, 60 m, *Bolus 8532* (K).

The following description, done from fresh material, amplifies those given by previous authors Schlechter and Dümmer.

Shrubs 0,2–0,8 m tall, with several branches arising from a single stem at ground level. *Branches* erect, clustered or forked, glabrous, becoming leafless; bark smooth, brown. *Branchlets* erect, slender, clustered, puberulous, pale or tinged with red, well-clothed with leaves but not hidden. *Leaves* 9,5 mm long including the petiole 1 mm long, 2,5–3 mm broad, lanceolate-oblong, acute, erect or spreading, incurved above, alternate, margins thick, scattered with spiky hairs; narrowed at the base to a short puberulous petiole; adaxial surface glabrous, flat; abaxial surface glabrous, scabrid, pubescent or smooth with or without minute gland dots; midrib prominent with short spiky hairs. *Inflorescence* terminal, aggregate, conspicuously involucred; florets solitary or several on much reduced branchlets at the perimeter, pink, maturing from the centre outwards, many aborting, only one in each head may eventually ripen and produce seed. *Involucral leaves* conspicuous, crowded, longer than the stem leaves varying in length up to about 15 mm long and in breadth, the innermost becoming almost filiform, linear, acute, almost mucronate, long petiolate, pale or whitish and glabrous on the upper surface, the under surface green towards the apex and clothed with a minute erect pubescence; margins minutely ciliolate. *Bract* one to each floret, varying from the outermost 12 mm long, linear-oblanceolate, green-tipped, to the innermost 3 mm long, tapering, acute, pale, ciliate, withering towards the apex. *Bracteoles* two, 1 mm long, 0,5 mm broad, lanceolate, acute, ciliate, glabrous or puberulous, translucent. *Calyx lobes* five, 2–2,5 mm long, 1,1 mm broad, lanceolate, acute, glabrous or puberulous, ciliate, translucent, reddened below. *Petals* five, 2–3 mm long, 0,7 mm broad, pink; *limb* 1 mm long, 0,6 mm broad, oblong, glabrous, apiculate; *claw* 2 mm long, 0,7 mm broad, elliptic, transversely bearded above, margins ciliate at the sides. *Stami-*

nodes five, vestigial, 0,1 mm long at the outer base of the disc. *Filaments* five, becoming 0,8–1,1 mm long, acicular, glabrous. *Anthers* five, before anthesis 1,1 mm long, 0,7 mm broad, wine-coloured; apical gland 0,1–0,12 mm diam., globose. *Pollen* 42–44 μ long, 18–20 μ broad, oblong. *Disc* 5-sinuate, scarcely exceeds the ovary, does not close over it, dark green, exudes nectar. *Stigma* 0,2 mm diam., capitellate, green. *Style* at first deflexed, becoming 1,4 mm long, glabrous. *Ovary* 5-carpellate, 0,7 mm diam., apices obtuse, rugulose, reddened. *Fruit* 5-carpellate, 6 mm long, 4,3 mm diam., calyx lobes persisting, the base of the calyx forming a pedicel 1,5 mm long, glabrous; gland dots inconspicuous, few; horns erect, short, entire. *Seed* 3,8–4,2 mm long, 1,5 mm broad, black, shining; aril mostly black.

Euchaetis longibracteata with its conspicuous involucral leaves is easily recognised as distinct. It should be noted that it falls into the group in which the disc is obvallate, not closing over the ovary and not spreading.

SPECIMENS EXAMINED

CAPE—3419 (Caledon): on stony hills near Elim, Bredasdorp Division (-DB), 80 m alt., 20/4/1896, *Schlechter 7627* (BM, BOL, E, G, GRA, K, P, PRE, S); in collibus Rietfontein Poort prope Elim, 200 ft., 10/12/1896, *H. Bolus 8532* (BOL, K), N. side, 120 ft., 11/1/1972, *Williams 1623* (NBG), S. side, 150 ft., 11/1/1972, *Williams 1624* (NBG); in collibus prope Elim, -/12/1896, *H. Bolus 8531* (BOL), -/7/1895, *H. Bolus 8478* (BOL), 300 ft., -/4/1897, *Schlechter 1817* (K, P, SAM *30531*); The Poort between Bredasdorp & Elim, 22/4/1933, *L. Bolus s.n.* (BOL *20528*, K), 24/1/1948, *Barker 5264* (BOL, NBG), 1/6/1947, *Compton 19559* (BOL, NBG), 12/2/1951, *Compton 22607* (NBG), 500 ft., 12/1/1968, *Williams 1157* (NBG), -/1/1948, *Lewis 3099* (SAM), 200 ft., 11/1/1972, *Williams 1618* (NBG); hills near Bredasdorp, 300 ft., -/7/1895, *H. Bolus 8473* (BM, BOL, K), 500 ft., -/7/1895, *F. Guthrie 3873* (BOL, NBG), 15/10/1951, *Esterhuysen 19133* (BOL, K, NBG); Hangnes farm, Soetanysberg, 400 ft., 28/12/1967, *Rourke 1010* (NBG, STE), 300 ft., 11/1/1972, *Williams 1622* (NBG).
—— 3420 (Bredasdorp): Vanderstelskraal, Bredasdorp Division (-AC), 450 ft., 2/7/1972, *Williams 1664* (NBG): near De Hoop vlei, Bredasdorp Division (-AD), 8/1/1950, *Taylor 90* (BOL); De Hoop, 8/4/1957, *Barker 8684* (BOL, NBG); at base of hills above De Hoop, 150 ft., 15/4/1972, *Williams 1645* (NBG); 2 miles S. of Wydelegen P.O., 500 ft., 17/12/1962, *Acocks 23174* (PRE); Potberg Estates S. of Hamerkop, Swellendam Division (-BC), 300 ft., 1/1/1971, *Oliver 3226* (K, S); Elandspad farm on road to Stillegat, Swellendam Division, 450 ft., 12/4/1972, *Williams 1640* (NBG); Cupidos Kraal, Potberg, Bredasdorp Division, 650 ft., 2/7/1972, *Williams 1666* (NBG), 600 ft., 22/1/1975, *Williams 1956* (NBG); 3,3 km S. of Potberg farm, Bredasdorp Division, 500 ft., 21/11/1973, *Williams 1871* (NBG); Cape Infanta, Swellendam Division (-BD), 22/1/1948,

Blum 272 (E); Bredasdorp (-CA), -/4/1927, *Dix s.n.* (SAM *41925*); 1,2 miles N.W. of Arniston, 14/12/1962, *Acocks 23141* (K, PRE).

DISTRIBUTION

E. longibracteata is found growing in pockets of soil upon limestone hills of the Bredasdorp series from Cape Infanta in the east to Rietfontein Poort at the end of the Soetanysberg in the west; a distance of approximately 100 km. In the vicinity of Rietfontein Poort and Hangnes Farm populations are found in level ground at the base of the limestone hills.

VARIATION

The abaxial leaf surface shows considerable variation and may be glabrous, scabrid, pubescent or smooth, with or without minute gland dots. Bracts, bracteoles, calyx lobes and petals may also vary somewhat in shape and degree of pubescence. The number of florets in each head is also very variable. Leaves may be somewhat spreading or erect and vary in shape and staminodes may sometimes be produced as a very slender filament. In one population the florets were seen not to open widely although the involucral leaves were spreading and conspicuous. Nearby a population was found where the petals became recurved but the involucral leaves remained somewhat closed. There is no explanation for this variability and the question remains as to whether this population may be cleistogamous.

The fact that *E. longibracteata* is found associated with the fairly recent Bredasdorp limestone and also that it is the only species in the sub-family *Diosmeae* to possess conspicuous involucral leaves may indicate that it is one of the more advanced species in the genus.

18. **Euchaetis esterhuyseniae** Williams in Jl S. Afr. Bot. **45** (2): 150 (1979). Type: CAPE—3219 (Wupperthal): ridge S.E. of Bloukop, E. Cold Bokkeveld, Ceres Division (-CB), 1 450–1 550 m alt., 18/5/1977, *Williams 2304* (NBG, holotype; BOL, K, L, MO, PRE, S, STE, isotypes).

Euchaetis esterhuyseniae is recognised as distinct having leaves small, ovate, glabrous, sessile, alternate and spreading, and small flowers with petals that soon fall away. Furthermore the disc is obvallate, the involucral leaves absent, the style at some stage deflexed, the petals 2,5–3 mm long and obtuse, the leaves neither villous ciliate nor sacculate but obtuse, fleshy and spreading.

19. **Euchaetis elsieae** Williams in Jl S. Afr. Bot. **40** (2): 85 (1974). Type: CAPE—3219 (Wupperthal): on a ridge S.E. of Bloukop, Cold Bokkeveld, Ceres Division 1 340–1 400 m alt., 8/6/1973, *Williams 1817* (NBG, holotype; BOL, C, K, M, MO, PRE, S, STE, isotypes).

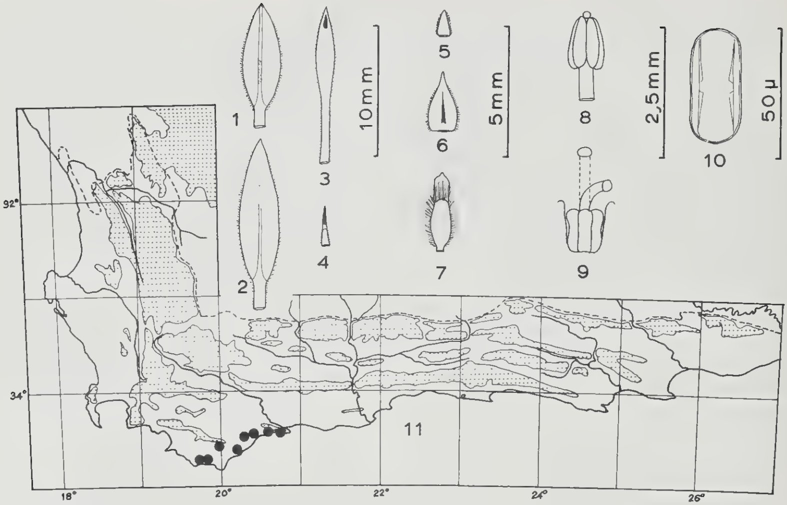

FIG. 11.
Euchaetis longibracteata: 1, leaf. 2, involucral leaf. 3, outermost floral bract. 4, innermost floral bract. 5, bracteole. 6, calyx lobe. 7, petal. 8, anther. 9, gynoecium and disc. 10, pollen. 11, distribution.

Euchaetis elsieae is recognised as distinct on account of its having linear elliptic obtuse leaves, somewhat thickened at the apex, flat on the adaxial surface (concave when dried) and rounded on the outside, with the flowers borne usually in pairs. It differs from *E. glomerata* Bartl. & Wendl., *E. elata* E. & Z., *E. linearis* Sond. and *E. flexilis* E. & Z., all of which have flowers aggregated into multiflorous heads and leaves varying from linear to lanceolate. It is nearest to *E. flexilis* but differs in that the apex of the leaf in *E. elsieae* is thickened whereas in *E. flexilis* it is sacculate.

ADDITIONAL SPECIMENS EXAMINED

CAPE—3219 (Wupperthal): Die Trap/Schurveberg, Cold Bokkeveld, Ceres Division (-CD), 4 700–4 800 ft., 8/12/1976, *Williams 2256* (NBG).

—— 3320 (Montagu): Pypsteelfontein near the beacon, Waboomsberg, Montagu Division (-CA), 4 400 ft., 5/2/1975, *Williams 1970* (NBG); Waboomsberg on road to Pypsteelfontein, 4 200 ft., 6/2/1975, *Williams 1971* (NBG); Pienaarspoort, east side, Ceres Division (-AA), 3 200–3 300 ft., 23/7/1975, *Williams 2022* (NBG).

—— 3321 (Ladismith): rocky slope at S.W. base of Peak Wood, Ladismith Division (-AD), 29/3/1959, *Esterhuysen 28253* (BOL).

Distribution

More recent collections from Pienaarspoort near Touws River, from the Waboomsberg near Montagu and from the Swartberg near Ladismith have considerably extended the range of this species towards the east.

Variation

In addition to notes made on variation in 1974, when the name was published, it was found that one population of *E. elsieae* from the Waboomsberg in the Montagu Division possessed flowers with beardless petals *(Williams 1971)*. This deficiency is apparently unique and has not so far been observed in any other species in the genus.

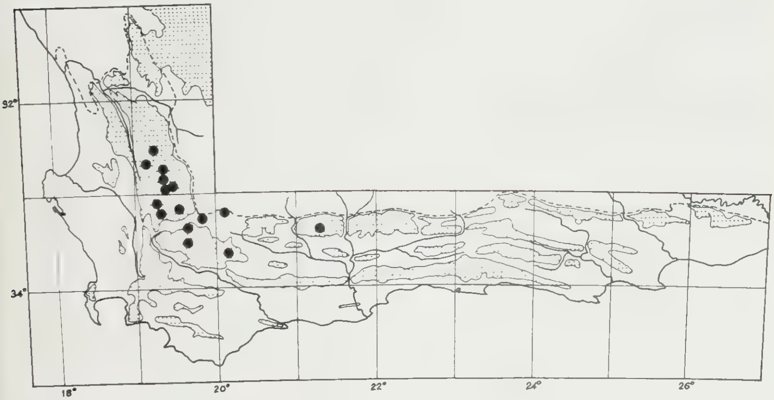

Fig. 12.
Euchaetis elsieae: distribution.

20. **Euchaetis linearis** Sond. in Flor. Cap. **1**: 372 (1860). Type: In grassy places at the Zwartberg, near Caledon Bath, July, *Ecklon & Zeyher 820* (S, lectotype; MEL, S, SAM, isotypes).

It is very often impossible to determine whether Ecklon or Zeyher actually made a collection of material cited under their joint names but in this case a collection by Zeyher, in the South African Museum Herbarium at Kirstenbosch, labelled *Zwartberg July* is probably an isotype and may indicate that in this instance the type material was gathered in July by Zeyher at Caledon. The following description, made from fresh material collected from the type locality, amplifies that of Sonder published in 1860.

Shrubs up to 0,4 m tall, erect, very slender, single-stemmed at base. *Branches* very few, straight, erect, very slender, glabrous, with a smooth reddish-brown bark. *Branchlets* few, straight, erect, very slender, glabrous or very sparsely puberulous, well-clothed with leaves. *Leaves* 6–11, 5 mm long, 0,9–1,3 mm broad, narrow-linear, acute with a sharp point, glabrous, sessile, adpressed erect, not imbricate; hyaline margins serrulate and narrow; adaxially slightly concave; abaxial surface round keeled with two rows of gland dots. *Inflorescence* a terminal reduced cyme with four flowers on each outer branchlet, up to 23 flowers in a head, often much less. *Bract* one to each flower, vary considerably in size, those on branchlets smaller, about 3 mm long, 0,7 mm broad, lanceolate, acute, glabrous, apex with a sharp mucro, hyaline margins somewhat serrulate, abaxial surface convex keeled, gland-dotted. *Bracteoles* two, similar to the bract, 2 mm long, 0,6 mm broad, lanceolate, acute, mucronate, glabrous, margins ciliolate-serrulate. *Calyx lobes* five, 2,8–3,4 mm long, 1,2 mm broad, broadly lanceolate, acute, apiculate, glabrous, gland-dotted, white, hyaline margins broad somewhat serrulate sometimes ciliolate at base. *Petals* five, 3,3 mm long overall; *limb* 1,5 mm long, 0,8 mm broad, elliptic, acute, glabrous, white; *claw* 1,8 mm long, 1 mm broad, narrowing below to a short petiole-like base, strongly transversely bearded above, translucent below, margins crisped ciliate. *Staminodes* five, vestigial, a minute gland about 0,05 mm diam., between the lobes of the disc. *Filament* five, becoming 1 mm long, acicular, glabrous. *Anthers* five, before anthesis 0,9 mm long, 0,7 mm broad, wine-coloured; apical gland minute, spherical. *Pollen* 43 μ diam., obloid, narrowed at the waist. *Stigma* 0,3 mm diam., globose, capitellate. *Style* at first deflexed becoming erect, 1,5 mm long, glabrous. *Ovary* 5-carpellate, 0,8 mm diam., glabrous, apices globose. *Disc* stands open, 10 sinuate, fairly sessile, exudes nectar, very like as in *Diosma*. *Fruit* (from *Williams 2209*) 5-carpellate, 6 mm long, 5 mm diam., glabrous, style persisting; *carpels* shining, smooth, green below, wine-coloured, with few gland dots; horns at most 1,5 mm long, not at all cleft, sub-acute. *Seed* 4,6 long, 2 mm broad, black, shining; aril black-streaked.

Euchaetis linearis is recognised as distinct having the disc standing open as in *Diosma* and the style at some stage deflexed, having leaves linear-acute with a straight sharp point, quite glabrous, hyaline margins, serrulate or smooth and fruits with horns not more that 1,5 mm long. Another useful character is the almost petiolate shape of the petal. The numerous small gland dots in the leaves readily distinguish *E. linearis* from *E. elata* where they are much larger in size and fewer in number.

SPECIMENS EXAMINED

CAPE—3319 (Worcester): West slopes of Swartgat Peak, Witsenberg, Tulbagh Division (-AA), 4 000 ft., 8/4/1950, *Esterhuysen 16917* (BOL); Ridge S. of Inkruip, Witsenberg Range, Ceres Division, 3 500–4 000 ft., 25/2/1973, *Esterhuysen 33143* (BOL); Little Winterhoek, N. E. side, 5 500–6 000 ft., 16/10/1960, *Esterhuysen 28528* (BOL); Great Winterhoek, 5 500 ft., 17/4/1960, *Esterhuysen 28467* (BOL); Hansiesberg, W. Slopes, Ceres Division (-AB), 3 000 –4 000 ft., 18/4/1956, *Esterhuysen 25725* (BOL); Waaihoek Plateau, Worcester Division (-AD), 5 000 ft., -/5/1942, *Stokoe 8500* (BOL); Waaihoek Peak, 3 000 ft., 25/8/1973, *Esterhuysen s.n.* (BOL); Mostertshoek Twins, 5 000–6 000 ft., 8/1/1944, *Esterhuysen 9818* (BOL), 9/4/1955, *Esterhuysen 24268* (BOL); Roodeberg, Waaihoek Mountains, Worcester Division (-CB), 3 500 ft., 10/8/ 1952, *Esterhuysen 20309* (BOL); Brandwacht Peak, 5 500 ft., 7/4/1963, *Esterhuysen 30128* (BOL); Fonteintjiesberg, 5 500 ft., 6/4/1975, *Esterhuysen 33805* (BOL), 5 000 ft., 9/3/1963, *Esterhuysen 30075* (BOL); Villiersdorp, Caledon Division (-CD), -/11/1946, *Stokoe 9346* (BOL).

——3418 (Simonstown): Mountain near Palmiet River Mouth, Caledon Division (-BD), -/4/1926, *Stokoe s.n.* (K, BOL *18767*).

——3419 (Caledon): Pone Bot River (-AA), 1 200 ft., 27/11/1896, *Schlechter 9454* (BM, BOL, G, GRA, K, P, PRE); In graminosis saxosis Zwarteberg prope Caledon (-AB), 1 300 ft., -/7/1892, *H. Bolus 6347* (BOL, K); Inter graminia alta (altit. IV) laterum montis Zwartberg prope thermas, Caledon -/7/-, *Ecklon & Zeyher 820* (MEL, S); Zwartberg, Caledon -/7/-, *Zeyher s.n.* (SAM *14662*); Caledon, Swartberg above the baths, 1 450 ft., 13/7/1973, *Williams 1824* (NBG), 1 500 ft., 16/9/1976, *Williams 2209* (NBG); Babylons Tower, Caledon Division (-AD), 23/6/1974, *Esterhuysen s.n.* (BOL); Zwartberg, Sandfontein, Caledon Division (-BA), 2 000 ft., 6/4/1897, *Schlechter 10350* (BM, BOL, G, GRA, K, PRE).

Distribution

Euchaetis linearis is found growing at altitudes of from 360–610 m (1 200 –2 000 ft.) in the Caledon Division and further to the north in the mountains of the Worcester, Tulbagh and Ceres Divisions at altitudes of 900–1 800 m (3 000 –6 000 ft.). In the Caledon Division the bracts and calyx lobes are pale, almost white in colour, while those of the populations to the north are dark or reddened. This may be due to their exposure to sunlight at higher altitudes. The total range from north to south is in the order of 130 km.

21. **Euchaetis longicornis** Williams in Jl S. Afr. Bot. **41** (3): 170 (1975). Type: CAPE—3421 (Riversdale): On the north slopes of Plaatjieskop between the Kaffirkuils and Soetmelks rivers (-AB), 240 m alt., 3/5/1974, *Williams 1896* (NBG, holotype; K, MO, M, PRE, S, STE, isotypes).

Euchaetis longicornis is recognised as distinct on account of its having subulate leaves, sharply pointed bracts and bracteoles, acuminate calyx lobes and fruits with exceptionally long (7 mm) horns. In addition it should be noted that the disc stands open, exceeding the ovary.

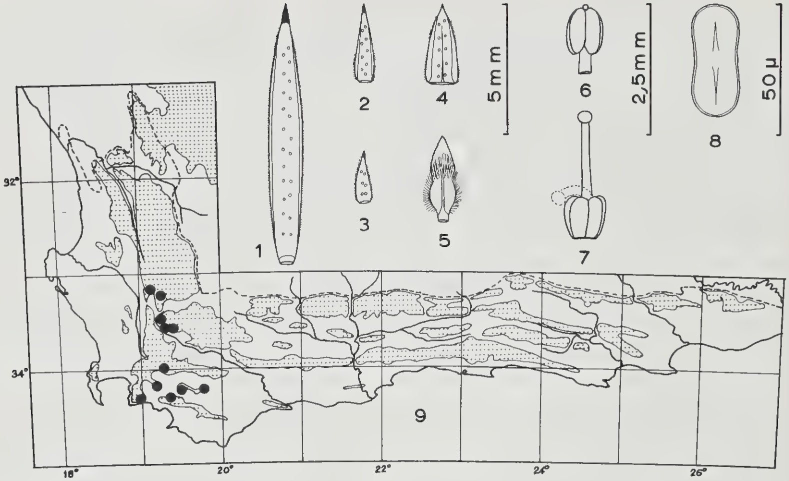

FIG. 13.
Euchaetis linearis: 1, leaf. 2, bract. 3, bracteole. 4, calyx lobe. 5, petal. 6, anther. 7, gynoecium. 8, pollen. 9, distribution.

22. **Euchaetis diosmoides** (Schltr.) Williams in Jl S. Afr. Bot. **40** (4): 280 (1974).

Acmadenia diosmoides Schltr. in Bot. Jb. **24:** 439 (1898). Type: CAPE—3419 (Caledon): on sandy places near Elim, Bredasdorp Division (-DB), 100–150 m alt., 20/4/1896 *Schlechter 7654* (BOL, lectotype; BM, K, P, PRE, W).

The following description in English supplements that given in Latin by Schlechter in 1896.

Shrubs 0,3–0,4 m tall, diffuse, single-stemmed at base. *Branches* erect, slender, somewhat lax, few in number, glabrescent. *Branchlets* erect, slender, reddened, puberulous with a minute erect pubescence, well-clothed with leaves. *Leaves* 10–12 mm long, 1,5–1,7 mm broad, linear-lanceolate, acute, incurved-mucronate, dark green, indistinctly gland-dotted, petiolate, alternate; midrib fairly prominent, at first somewhat pubescent becoming glabrous; margins ciliate becoming serrulate. *Inflorescence* terminal, with up to 60 florets at the ends of very short branchlets aggregated into heads. *Bract* one to each floret, 4–4,5 mm long, 0,8 mm broad, linear-lanceolate, acute, mucronate, glabrous except for a few hairs on the prominent midrib, ciliate, obscurely gland-dotted. *Bracteoles* two, 2 mm long, 0,6 mm broad at base, lanceolate-acute, minutely mucronate, ciliolate, glabrous; margins translucent. *Calyx lobes* five, 2,6–3 mm long, 0,9–1,4 mm broad, oblong, acute, incurved-mucronate, adaxially pubescent otherwise glabrous, brown or purplish above; margins translucent, ciliolate. *Petals* five, 4 mm long overall; *limb* 2–2,3 mm long, 1,4–1,7 mm broad, orbicular, white, subacute; *claw* 1,8–2 mm long, 0,9–1,4 mm broad, transversely bearded and ciliate above, narrowed and glabrous below. *Staminodes* five, 0,15 mm diam., vestigial, upon the elevated lobes of the disc. *Filaments* five, becoming 1 mm long, glabrous. *Anthers* five, 0,9 mm long, 0,6 mm broad, reddened, apical gland minute. *Pollen* 38 μ long, 20–25 μ broad, ellipsoid. *Disc* sinuate-crenulate, spreading, green, fleshy, exceeds the ovary at first. *Stigma* 0,3–0,5 mm diam., capitellate. *Style* 0,6 mm long, glabrous, at some stage deflexed. *Ovary* 5-carpellate, 0,7 mm diam., apices reddened. *Fruit* 5-carpellate, 4–5 mm long, 3,5–4,5 mm diam., glabrous or with a few spiky hairs along the upper edges on the inside; horns 0,7–1,0 mm long, with a sunken gland near the apex. *Seed* 2,7–2,9 mm long, 1,5 mm broad, black, shining; aril black.

Euchaetis diosmoides is recognised as distinct having the disc open, sinuate-crenulate as in *Diosma*, the style at some stage deflexed, the stigma 0,3–0,5 mm diameter, and leaves acute, incurved-mucronate. It appears to be nearest to *E. schlechteri* which differs in having the style always erect with the stigma 0,6–1,0 mm diameter.

SPECIMENS EXAMINED (additional to those previously cited)

CAPE—3419 (Caledon): 15 miles from Elim along road to Struisbaai, Bredasdorp Division (-DB), 17/9/1962, *Esterhuysen 29689* (BOL); Toekoms near Boskloof, S. side Bredasdorp Mtns., Bredasdorp Division, 600 ft., 24/2/1977, *Williams 2275* (NBG); S. slopes Bredasdorp Mts., 6/12/1938, *Halfstrom & Acock 2177* (S).

—— 3420 (Bredasdorp): Bredasdorp Mtns., S. end near Preekstoel Rock (-CA), 400–600 ft., 20/5/1975, *Williams 2002* (NBG); Wild flower garden, Bredasdorp, 450 ft., 13/7/1976, *Williams 2183* (NBG); Potberg, ridges south east of main peak (-BC), 1 000 ft., 2/1/1971, *Oliver 3232* (STE).

23. **Euchaetis schlechteri** Schinz in Mem. Herb. Boiss. **20**: 19 (1900). Type: CAPE—3418 (Simonstown): in saxosis prope Sir Lowrys Pass (-BB), 400 ft., 15/7/1892, *Schlechter 1171* (BOL, G, GRA, K, isotypes).

The following description, done from fresh material collected near Caledon, supplements that given in Latin by Schinz.

Shrubs 250–350 mm tall, with several erect stems arising from a stoutish rootstock which may survive veld burning. *Branches* di-/tri-chotomate, slender, minutely puberulous, not hidden by the leaves, becoming glabrous and somewhat rough with leaf scars. *Leaves* varying up to 15 mm long, 2 mm broad, narrowly lanceolate, mucronate, often drawn out into a sharp point, keeled, erect spreading or recurved, alternate or opposite; margins scabrid, ciliate at first; abaxial surface and keel crisped pubescent at first becoming glabrescent,

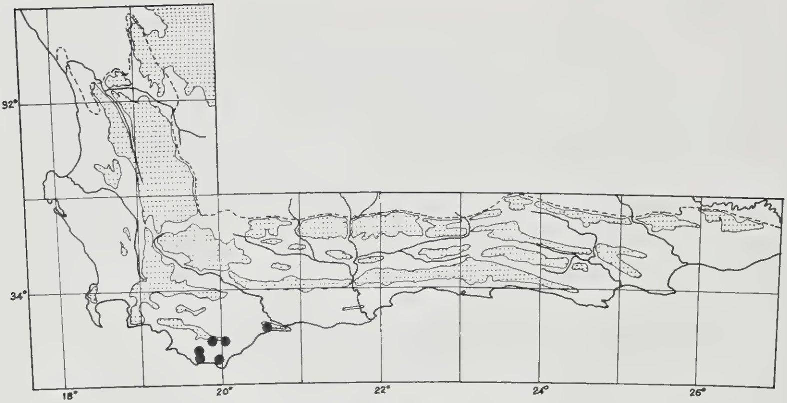

FIG. 14.
Euchaetis diosmoides: distribution.

without conspicuous gland dots; petiole very short. *Inflorescence* terminal, the flowers aggregated into compact globose heads, in groups of up to nine at the ends of up to five branchlets. *Bract* one, leaf-like, 5–7,5 mm long, 1,5 mm broad. *Bracteoles* two, 2,3–4,5 mm long, 1 mm broad, lanceolate, acute, ciliate, minutely crisped pubescent, reddened above. *Calyx lobes* five, 3–4,2 mm long, 1,6 mm broad, lanceolate, pubescent, ciliate; apex acute, purplish; margins translucent below; adaxial surface beneath the elevated purplish rib is hollowed and pubescent. *Petals* five, 4,7–5,3 mm long, white or somewhat pink; *limb* 1,5–2 mm broad, elliptic, glabrous, minutely serrulate; *claw* 1,5 mm broad, narrowing to 0,5 mm below, transversely bearded and ciliate above, one or two hairs scattered below. *Staminodes* five, 0,15 mm diam., globose, vestigial. *Filaments* five, becoming 1,5 mm long, subulate, glabrous. *Anthers* five, before anthesis 0,8 mm long, 0,7 mm broad, wine-coloured; apical gland spherical, minute. *Pollen* 53 μ long, 28 μ diam., obloid. *Disc* stands open, sinuate-crenulate, exceeding the ovary, fleshy, dark green, exudes nectar. *Stigma* 0,6–1 mm diam., capitate, dark green. *Style* becoming 1,2 mm long, glabrous, virtually always erect. *Ovary* 5-carpellate, glabrous, lobes reddened, obtuse. *Fruit* 5-carpellate, 6,3 mm long overall, almost glabrous except for a few minute hairs; horns 1,8 mm long, minutely cleft without any gland; style persisting. *Seed* 3,5 mm long, 1,8 mm broad, black, shining, the surface rippled; aril small, black.

SPECIMENS EXAMINED

CAPE—3418 (Simonstown): in saxosis prope Sir Lowrys Pass, Somerset West Division (-BB), 400 ft., 15/7/1892, *Schlechter 1171* (BOL, G, GRA, K).
—— 3419 (Caledon): clay soil above Cape Road, ¼ mile W. of Caledon (-AB), -/9/1926, *Pillans s.n.* (BOL *18567*); along the National Road above Caledon on

Bot River side, 10/4/1971, *Esterhuysen 32593* (BOL); W. end of Caledon between old road and National Road, 800 ft., 7/6/1972, *Williams 1653* (NBG); Cape Town end of Caledon below the road, 800 ft., 13/3/1973, *Williams 1825* (NBG); Hemel en Aarde, Caledon Division (-AC), 24/2/1941, *Esterhuysen 5012* (BOL); clay hills E. of Bot River Bridge, 31/8/1977, *Goldblatt 3993* (MO); Shaws Pass, Caledon Division (-AD), -/2/1940, *Walgate 72* (BOL); N. side Shaws Pass, 8 km S. of Caledon, 285 m, 24/1/1979, *Burgers 1707* (CPA Nature Conservation Herbarium).

—— 3420 (Bredasdorp): 18 km from Bredasdorp towards Swellendam (-AC), 600 ft., 12/8/1973, *Williams 1839* (NBG).

Euchaetis schlechteri is a distinct species most readily distinguished by the disc being open sinuate-crenulate as in *Diosma* and the capitate stigma 0,6–1,0 mm diam. The lanceolate, often pungent leaves up to 1,5 mm long, without obvious gland dots, also make it easy to recognise. It may be distinguished from *E. diosmoides* which has a much smaller stigma 0,2–0,5 mm diam.

DISTRIBUTION

E. schlechteri is found growing in clayish soil at altitudes of from 120 to 285 m above sea level in rather widely scattered localities from Sir Lowrys Pass to the Bredasdorp ruggens, but is mainly concentrated in the Caledon district. It seems to be rather rare and when found very few plants are to be seen. It may have possibly been largely eliminated by cultivation.

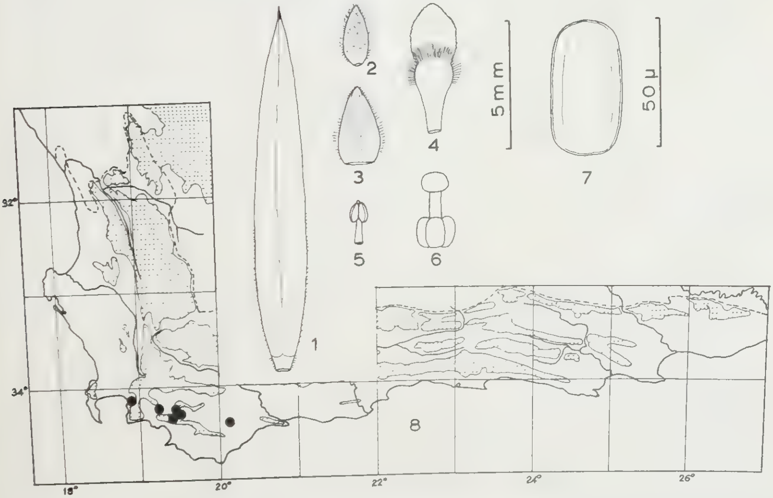

FIG. 15.
Euchaetis schlechteri: 1, leaf. 2, bracteole. 3, calyx lobe. 4, petal. 5, anther. 6, gynoecium. 7, pollen. 8, distribution.

SPECIES EXCLUDED

A. *euchaetis dubia* Sond. in Flor. Cap. **1**: 373 (1860).
Macrostylis dubia Benth. & Hook. Gen. Plant. **1**: 289 (1867).

Portions of *Zeyher 291* were seen independently by both Turczaninov (1858) and Sonder (1860). As this material showed only flowers in the earlier stages before the elongation of the style and filaments had taken place Turczaninov was led to place it in *Acmadenia* and Sonder to place it, rather doubtfully, in *Euchaetis*. However it appears that this plant should rather be placed in *Macrostylis* as was noted by Bentham and Hooker (1867). Due to prior publication the epithet *cassiopoides* has precedence over *dubia* and the combination *Macrostylis cassiopoides* has therefore to be made.

Macrostylis cassiopoides (Turcz.) Williams, comb. nov.

Acmadenia cassiopoides Turcz. in Bull. Soc. Imp. Nat. Mosc. **31**. 1: 439 (1858). Type: Lang Valley, *Zeyher 291* (S, lectotype; SAM, isotype).

B. *Euchaetis uniflora* Phillips in Ann. S. Afr. Mus, **9**: 115 (1913) = *Acmadenia uniflora* (Phillips) Phillips in Jl S. Afr. Bot. **9**: 137 (1943).

PHYTOGEOGRAPHY

The maps showing the distribution of species of *Euchaetis* have been combined and illustrated in Figure 2. Ten species make up a north-south distribution pattern. Here the plants are found growing in mountainous areas on quartzitic acid soils derived from the Table Mountain Sandstone. Thirteen entirely different species make up an east-west distribution pattern. Of these, three very distinct taxa are found in mountainous areas growing in acid soils derived from the Table Mountain Sandstone. A further three species are found on the coastal plain on soils associated with silcrete, ferricrete or clay and seven species are found fairly near the coast in sandy soils either on or associated with the Bredasdorp limestone beds. It should be noted that no species of *Euchaetis* is to be found on the plains of the west coast from the Cape Peninsula northwards.

Considering first the montane species which are quite distinct and well-defined, *Euchaetis tricarpellata* with its unique three-carpellate ovary is isolated geographically from all others being found only on Piketberg, a detached mountainous area opposite St. Helena Bay. Also, just as isolated, being the only species to be found on the whole of the Langeberg, Outeniqua and Tzitzikamma mountains, is *E. avisylvana* with its distinctive villous-ciliate leaves. Much further to the east, in the Koega and Baviaanskloof mountains, after a disjunction of about 290 km, one finds *E. vallis-simiae*, a very distinct species with the leaves gibbous behind the apex and a pubescent ovary. Still further to the east, in the Cockscomb mountains, *E. cristagalli* marks the easterly limit to the distribution of the genus.

Of the seven more or less coastal species, *E. longibracteata*, *E. laevigata* and *E. intonsa* are easily distinguished. Only the last four appear to be somewhat difficult to separate. They are *E. albertiniana*—*E. burchellii*—*E. scabriscosta*—*E. meridionalis* in that order and it is possible that hybrids between these species may be noticed in the future. The habitat they occupy is almost certainly of more recent origin than that of the montane species and it is possible that speciation here has more recently taken place. *E. burchellii* has the widest distribution of all species of *Euchaetis* being found from the Uilenkraals River in the west to Herolds Bay in the east, a distance of about 275 km.